

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

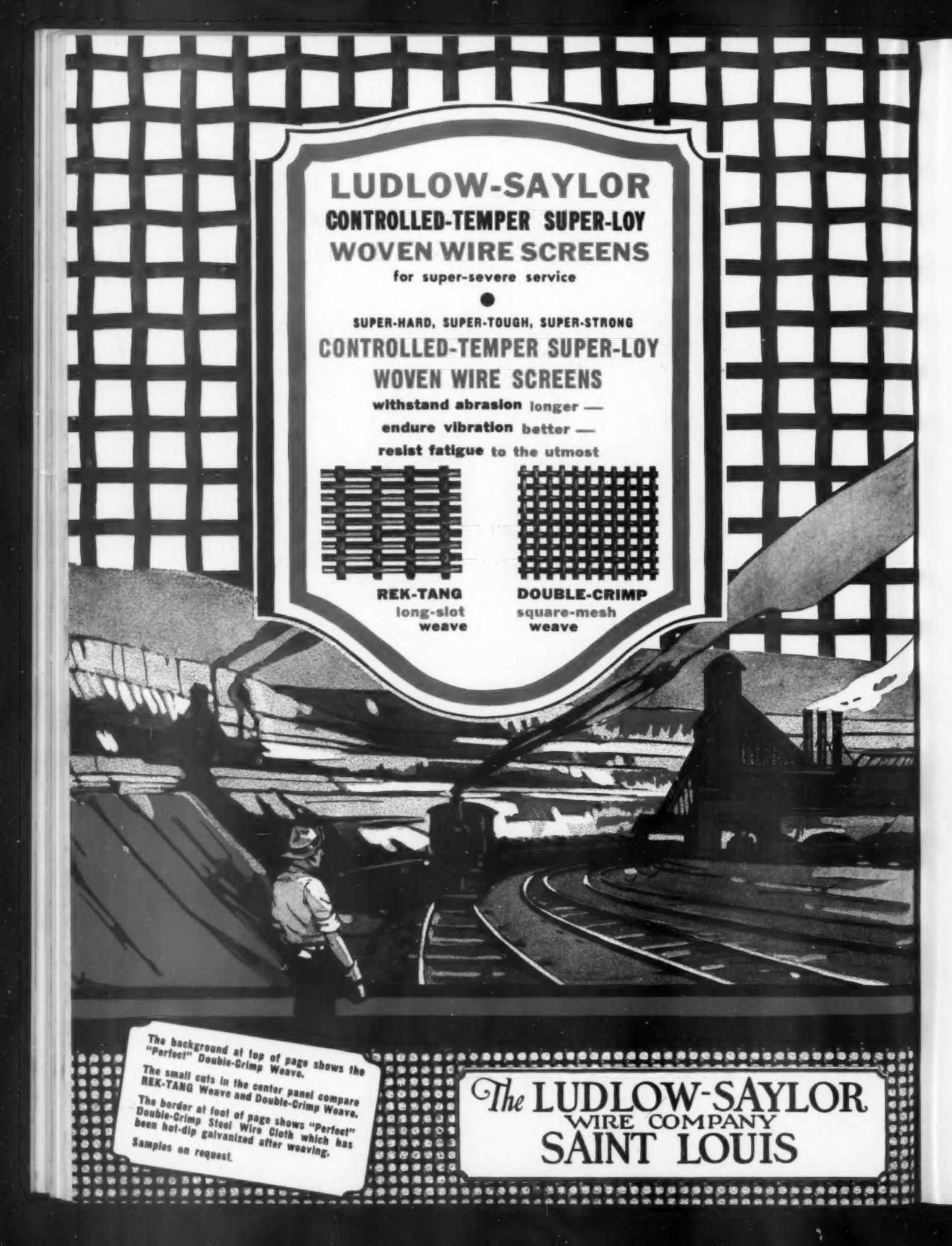
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B&W PULVERIZERS

FOR DIRECT FIRING
... are an important aid in
modern cement manufacture

B&W Pulverizer
Type E.
one of five
in an eastern
cement plant

THE BABCOCK & WILCOX CO. 85 LIBERTY STREET, NEW YORK, N. Y.

BABCOCK & WILCOX



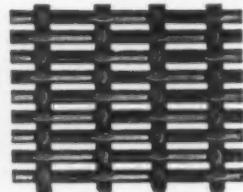
LUDLOW-SAYLOR CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

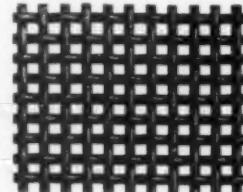
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG
CONTROLLED-TEMPER SUPER-LOY

WOVEN WIRE SCREENS

withstand abrasion longer —
endure vibration better —
resist fatigue to the utmost



REK-TANG
long-slot
weave



DOUBLE-CRIMP
square-mesh
weave

The background at top of page shows the
"Perfect" Double-Crimp Weave.

The small cuts in the center panel compare
REK-TANG Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect"
Double-Crimp Steel Wire Cloth which has
been hot-dip galvanized after weaving.

Samples on request.

The **LUDLOW-SAYLOR**
WIRE COMPANY
SAINT LOUIS

EASTON DOUBLE-BODIED
PHOENIX SEMI-TRAILER
(TRACKLESS MINE CAR)



Problem: Big Load, Small Hopper

The problem was to haul a big load from the shovel to be dumped into a small hopper opening. To save fuel, tires and other haulage costs it was found desirable to use Semi-Trailers carrying comparatively large loads. But 17 tons entering the small hopper in one discharge would choke the crusher.

To meet requirements, the container, which would normally be a body of 17 tons capacity, or larger, was divided into two sections each of which will be dumped independently. The half-loads discharged will be easily handled by the crusher, while the operator benefits from all the advantages of Easton Semi-Trailer Haulage... including high speed, low costs, and big payloads.

A new idea? No. This unit is now being built for a Southern producer. But, in principle, it was

blueprinted at Easton several years ago. It's the new application and the sound engineering which make it interesting. Also, it serves to illustrate how an Easton Survey, tapping a limitless reservoir of quarry haulage experience, might help you. That is why we urge our friends to let Easton Engineers study their problems now and plan ahead for the future.

Our first job today is to meet wartime handling requirements. Our production facilities are turned to that effort. But there's no priority on ideas. Easton experts will go all out to help you.

EASTON

CARS • SEMI-TRAILERS • TRUCK
BODIES • FOR QUARRY SERVICE

EASTON CAR & CONSTRUCTION CO., EASTON, PA.

Rock Products

Recognized the World Over as the Leader in Its Field

With which have been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 45, No. 4, APRIL 1942

Contents of This Issue

Rock Products Operators' War Activities

Nathan C. Rockwood 27

Diesel Power for New Quarry

Crushed stone plant has production of 350 tons per hour. Blast one acre at a time E. U. Ragland 34

Men—For Efficient Kiln Operation

First of a series of three articles on men, material, and machinery requirements Ralph Gibbs 36

Automatically Controlled Dredge

All-steel dredge built by The Warner Co. Irving Warner 38

Topics for Plant Safety Meetings

Article 2. Inspecting the plant for accident hazards A. J. R. Curtis 42

Efficient Enclosures Solve Dust Problem

Lynn Sand and Stone Co. has developed a system of plywood enclosures for screens, crushers, etc. Bro Norgberg 44

Control and Collection of Industrial Dust

E. D. Powers 46

Lime Experimentation

Victor J. Azbe 49

Strong Plaster for Paperless Wallboard

New process of gypsum manufacture involves "cooking" raw gypsum in Epsom salts solution W. A. Cunningham 50

Effect of Admixtures on Portland Cement

Chas. H. Jumper and Geo. Kalousek 54

Practical Operation Conveyor Belts

Melvin C. Dow and Harvey A. Harnden 56

Selling Concrete By Specification

Ralph S. Torgerson 63

Making Porous Concrete Pipe

Walter B. Lenhart 64

Fluorescent Lighting for Block Plant

66

Increasing Life of Wire Rope

74

Departments

Staff Letter	19	New Equipment	58
Editorial	27	Concrete Products	61
Hints and Helps	30	News of the Month	76
News About People	32	Traffic News	92
Lime Forum	48	Obituaries	100
Chemists' Corner	54	Index to Advertisers	112

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*



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ROCK PRODUCTS

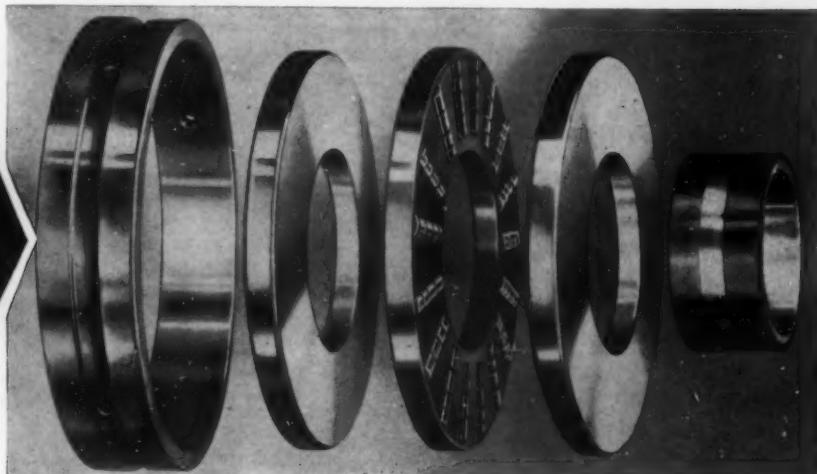
Cut the Load in TWO PARTS...



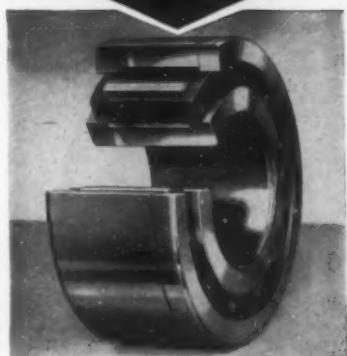
Stop Overworking Your Bearings

during the Non-Stop, 168 Hour Week

It's a common mistake to think of thrust loads as part of the main load and to lump them all on combination radial-and-thrust bearings. But it's tough on bearings, tough on power sources, tough on lubrication and maintenance men, and it *shortens bearing life*—also cuts the load that can be carried in given dimensional limits.



SPLIT THE LOAD and SAVE THE BEARING



Top—Type SDT
Thrust Bearing—
double-acting.

Above—Type MN
Double Width Radial
Bearing.

Engineered to Provide Standard Sizes for Most Applications

Engineered for thousands of applications in various industries, Rollway's wide range of series and types provides standard metric dimensions and tolerances for practically every design. Hence you insure easier replacement or change-over and lower cost. *Send us your drawings—particularly your conversions—for free engineering analysis and bearing recommendations.*

ROLLWAY

BEARING COMPANY, INC., SYRACUSE, N. Y.

BUILDING HEAVY-DUTY BEARINGS SINCE 1908

BEARINGS

Buckeye Trench Hoe speeds excavations, roughing out sewers and big trench at 4th Armored Division's Pine Camp — facilities for 15,000 men, project covers 16,000 acres, near Watertown, N.Y.

Clipper Shovel Operators Lead the Life of Reilly!



yet average more yards on every shift

The Buckeye Clipper's Mevac (metered vacuum) Power Control makes shovel operating a "white collar" job. Six "palm fitting" handles — grouped with those used most in easiest reach — do the job smoothly and quickly, guiding the shovel through its work cycle. And yet the "feel" is as sensitive as on old steam rigs. Upholstered operator's seat, arm rest, 21° clear view — no wonder operators deliver plus yardage right up to the end of the shift.

Vacuum Power Control saves for you, too, Boss — ask the maintenance men of those that own them. No leaky pressure lines, no mechanical jamming and jerking, longer clutch lining life, longer rope wear, all-season operation — there's nothing to condense or freeze in the Mevac System, no linkage troubles. And vacuum control is only one of 24 preference points!

The Clipper is tomorrow's shovel today. They're cutting costs everywhere for contractors, pits, quarries, material yards and municipalities. Three models

The "50"

$\frac{1}{2}$ yd.

The "60"

$\frac{3}{4}$ yd.

The "70"

$\frac{3}{4}$ yd.

Quickly convertible to crane, dragline, trench hoe, pile driver — gasoline or diesel powered.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

Built by Buckeye ✓

Convertible Shovels



Trenchers



Tractor Equipment



R-B Finegraders



Road Wideners

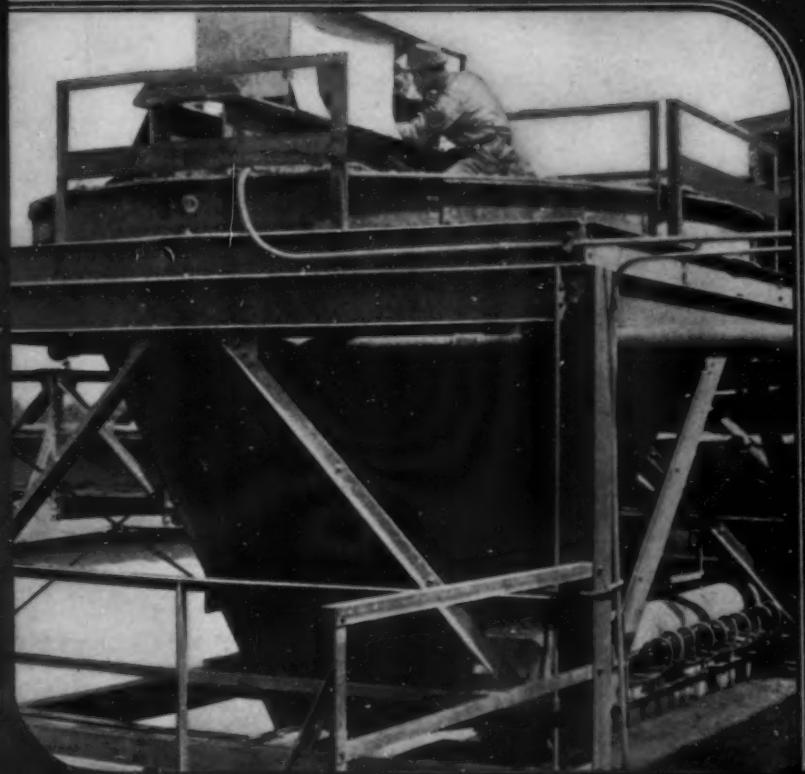


Spreaders



FOR COOLING HOT CEMENT

FLS



Cement manufacturers are constantly confronted with the problem of cooling hot cement to temperatures acceptable to their customers when making bulk shipments or for immediate packing in paper bags. • The FLS Conical Cement Cooler has been especially developed for cooling hot cement to relatively low temperatures. • It consists of a water-cooled conical tank, provided with an agitating device and a specially designed feeder which insures uniformity without flushing. • Recommendations will be gladly submitted.

F. L. SMITH & CO.

Designers of Cement Making Factories, Manufacturers
of Machinery for Making Cement and Lime, etc.

60 EAST 42nd STREET

NEW YORK, N. Y.



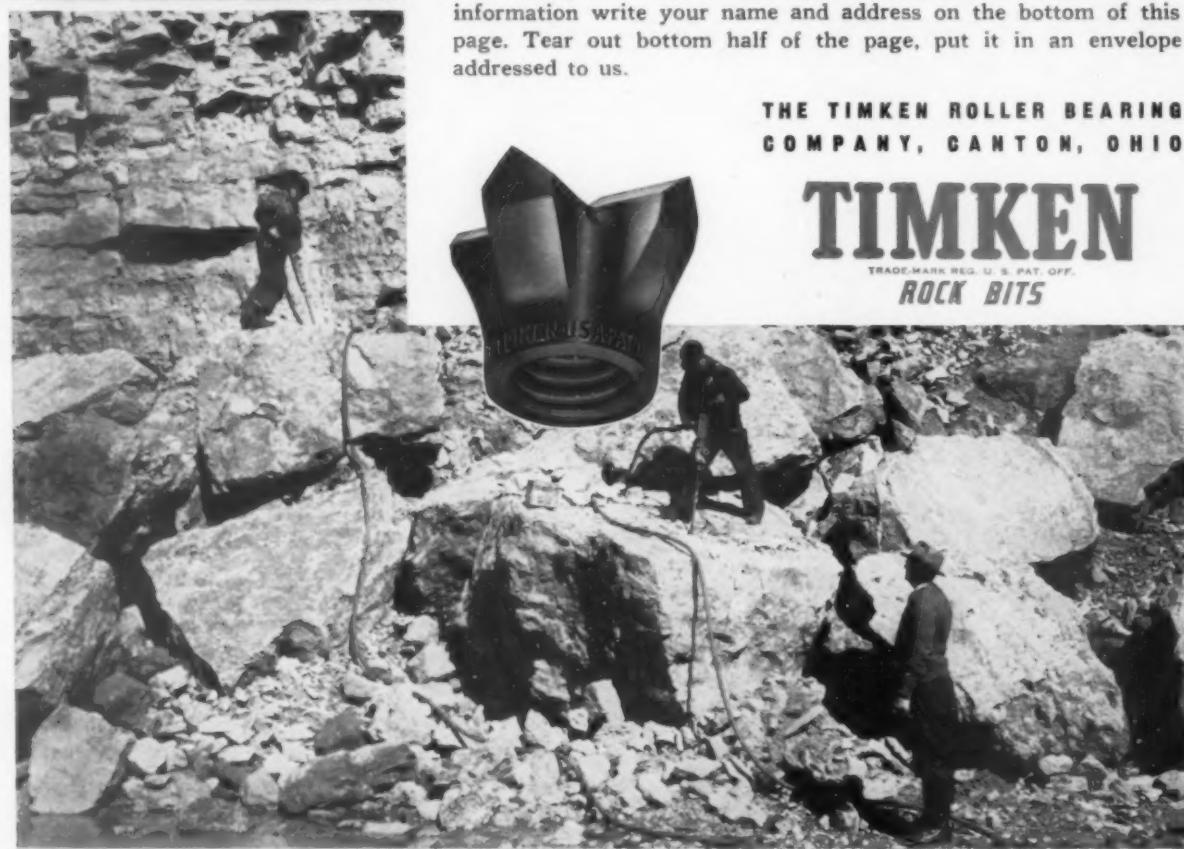
Essential to steel production, construction and agriculture, limestone is a vital material in the Victory production program. Two limestone quarries (shown here) of the world's largest producers, located in northern Ohio, have used Timken Rock Bits for several years.

If the advantages of Timken Bits were significant enough for these operators to adopt them in peace time it is certain that these advantages have been greatly magnified by the war.

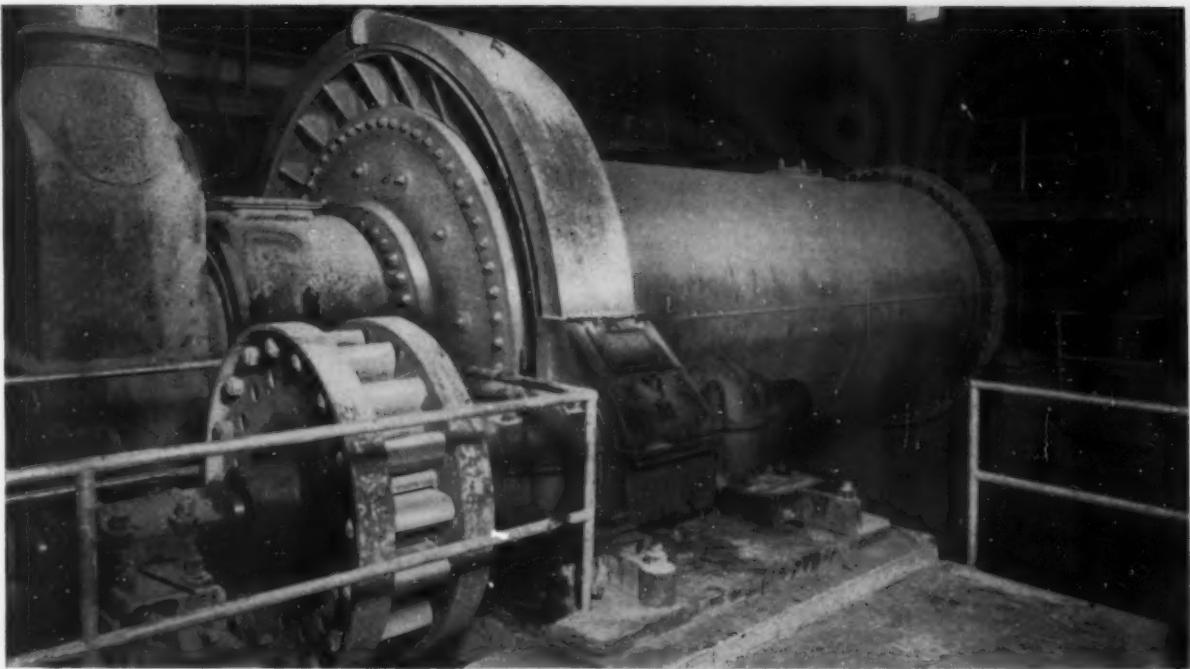
If you are not using Timken Bits you will never gain more by adopting them than you can today. And every day you wait before investigating their possibilities costs you money. To request further information write your name and address on the bottom of this page. Tear out bottom half of the page, put it in an envelope addressed to us.

THE TIMKEN ROLLER BEARING
COMPANY, CANTON, OHIO

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS



"— GRINDING MILLS BY TRAYLOR"



WE BUILD

Rotary Kilns
 Rotary Coolers
 Rotary Dryers
 Rotary Slakers
 Scrubbers
 Evaporators
 Jaw Crushers
 Gyrotary Crushers
 Reduction Crushers
 Crushing Rolls
 Grinding Mills
 Ball Mills
 Rod Mills
 Tube Mills
 Pug Mills
 Wash Mills
 Feeders
 Rotary Screens
 Elevators

Many times within more than twenty years past, and increasingly so during recent years, grinding equipment of Traylor manufacture has been specified when new plants in the cement and process industries were projected, or old plants modernized. This has been the case so frequently, in fact, that it seems almost that the engineers have dismissed their grinding problems with "grinding mills by Traylor," so as to devote more time to the study of other details.

Considering the responsibility resting upon the shoulders of these engineers, which compels them to be absolutely sure of their ground when specifying equip-

ment, we are highly gratified by the confidence they repose in Traylor. So we are always striving to continue meriting it.

Consequently, the principal business of our engineers is to keep "up on" developments in the cement and process industries, so as to meet, and even anticipate their needs and have the solutions all worked out and on call.

No matter what size of mill you may need, or for whatever purpose, a Traylor will "deliver the goods" at highest efficiency and lowest unit cost. We pay our engineers for service to you—use them. They are available at any time, anywhere.

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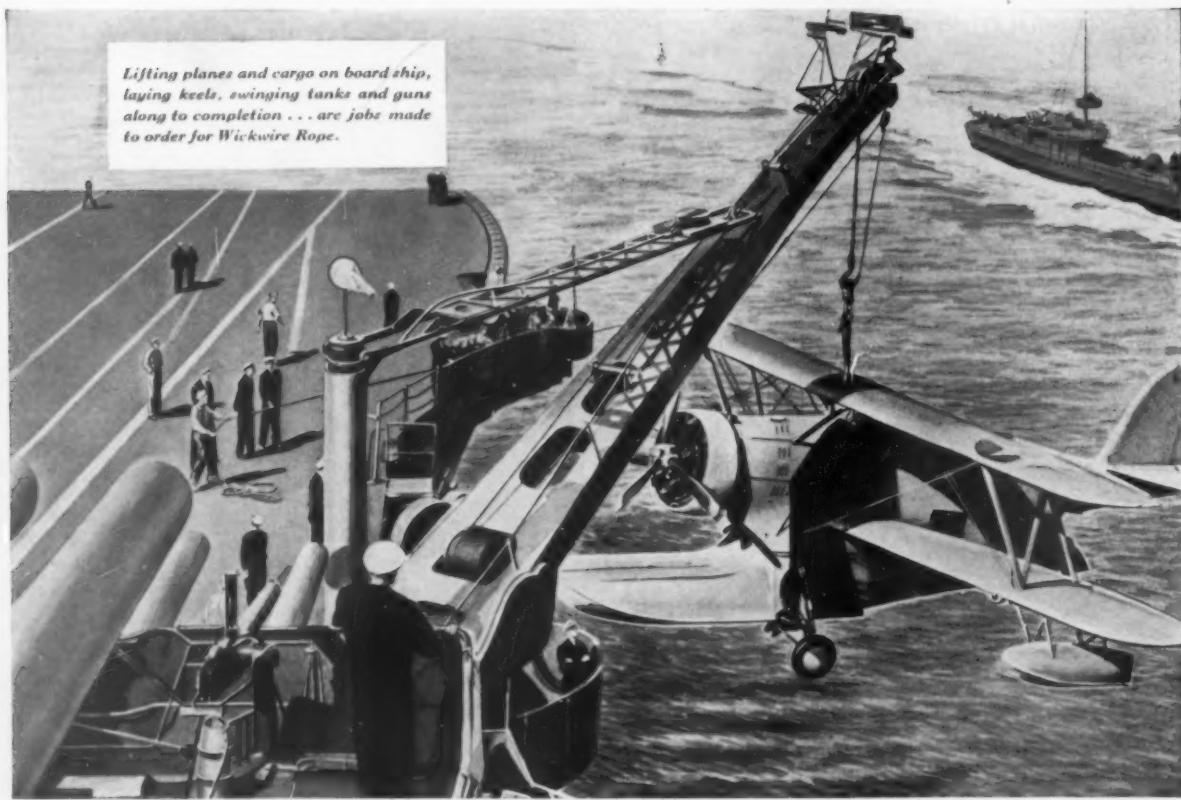
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 6311-22d, Ave. N. E.



• BRINGING WARBIRDS HOME TO ROOST

Another Job for Wickwire Rope

It takes a lot of "heavy work" to win this war—and where the hoisting, hauling and pulling are toughest, there you'll find Wickwire Rope on the job.

The vital need for this vital steel tool of heavy industry points up a message to all users of Wire Rope.

Make your Wire Rope last longer . . . save steel too . . . by taking proper care of Wire Rope on the job.

And when you need Wire Rope, depend on Wickwire regular lay or pre-formed Wissco lay. Let our field men figure your exact needs, and show you how to get the most for the least. Then, after the Wickwire Rope is on the job, our field represen-

tative will also consult with you on ways to get most efficient performance.

The uniformity and long-life of Wickwire Rope is assured by our manufacturing methods, which control every step from ore pile, to blast furnace, to open hearth, to finished rope.

To make wire rope last longer, it's important to consult our authoritative manual "KNOW YOUR ROPES." More than 25,000 users all over the world consider it a bible on the selection, application and handling of wire rope. Write for free copy to: Wickwire Spencer Steel Company, 500 Fifth Ave., New York, N.Y.



THE LOWLY OIL CAN will pay dividends in making wire rope last longer. Internal wear can only be minimized by proper lubrication. Without it, there is excessive friction, binding and grooving, which result in premature failure. This and forty more rope life-savers are fully described in our free booklet "Know Your Ropes."

SEND YOUR WIRE ROPE QUESTIONS TO WICKWIRE SPENCER



WICKWIRE ROPE

Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City



ROCK PRODUCTS

YOU TOO
CAN SAVE

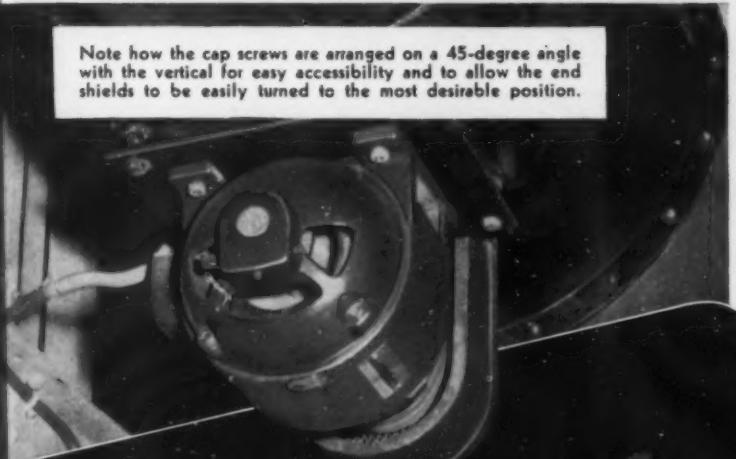
TIME...

TROUBLE

Settling dust gets nowhere with this Tri-Clad motor—driving a blower. Its sleeve-bearings are sealed against dust and dirt by complete enclosure in cast iron.



Note how the cap screws are arranged on a 45-degree angle with the vertical for easy accessibility and to allow the end shields to be easily turned to the most desirable position.



SPECIFY

TRI CLAD MOTORS

1. Extra Protection AGAINST PHYSICAL DAMAGE
2. Extra Protection AGAINST ELECTRICAL BREAKDOWN
3. Extra Protection AGAINST OPERATING WEAR

Tri-Clad motors are now available in standard, open construction, and in a wide range in standard types and ratings. Ask your G-E representative for complete details, or write General Electric, Schenectady, N.Y.

... by using

TRI CLAD MOTORS

REG. U.S. PAT. OFF.
on your FANS and BLOWERS

MANY fans and blowers must be installed high above the factory floor, or in awkward locations where working space is limited. Here's where the Tri-Clad motor becomes a real time-saving aid to hard-pressed installation crews hurrying to get vital equipment into production.

Tri-Clad motors are a cinch to install because of their light weight and compactness. Also, their shape facilitates ease of handling, by hand or with slings. Four-position end shields permit flexibility in mounting, and the roomy four-position conduit box affords unrestricted working space. All leads are permanently identified. In addition, Tri-Clad features facilitate lubrication and other routine maintenance.

Specify Tri-Clad motors on your next order. You, too, will find that they save precious man-hours when you're installing equipment essential to the war program.

BUILT FOR PROTECTION FIRST . . . TO LAST!



General Electric and its employees are proud of the Navy award of Excellence made to its Erie Works for the manufacture of naval ordnance.

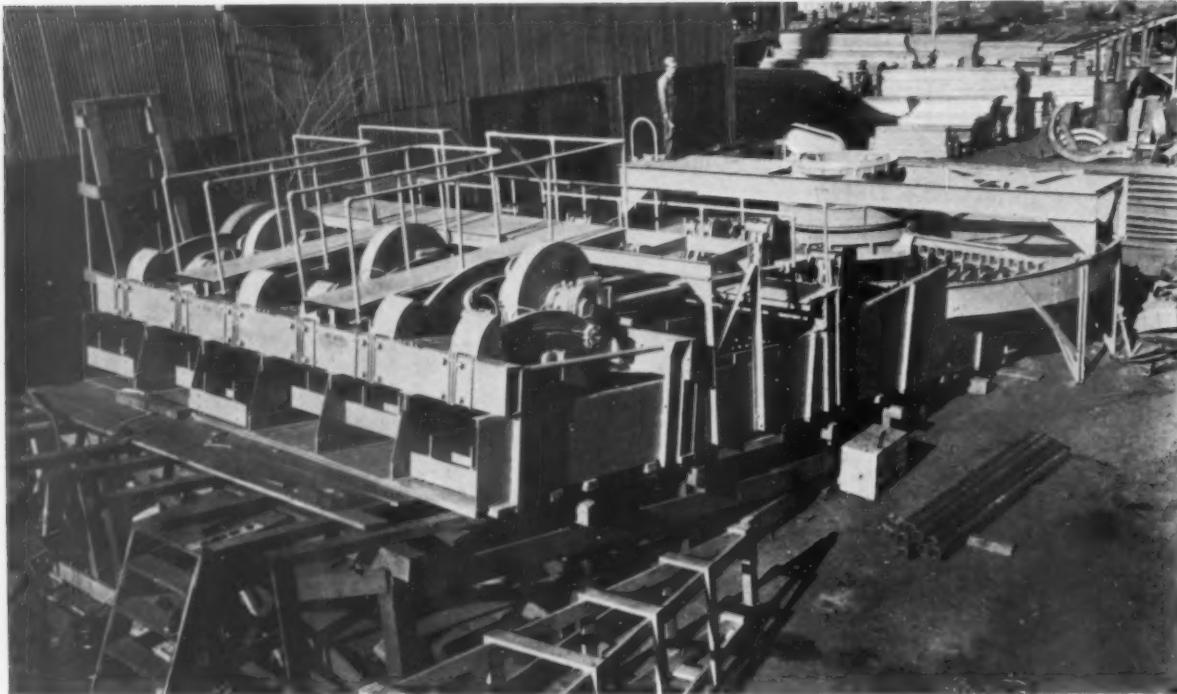
Here again, light weight and convenience in mounting and lubrication are important advantages of this Tri-Clad motor driving an exhaust fan.



GENERAL  ELECTRIC

750-117-5025

BIGGEST DORR BOWL CLASSIFIER



Dorr Sextuplex FX Bowl Classifier, 20 ft. wide, 39 ft. long with 25 ft. dia. bowl, assembled at shops prior to shipment.



ADVANTAGES OF DORR C.C.G.

- **Less Raw Grinding Power**—35 to 50% less
- **Greater Ball Mill Capacities**—100 to 125% more
- **No Tramp Oversize**—Less than $\frac{1}{4}$ of 1 percent plus 100 mesh when overflowing 96-98% minus 200 mesh
- **More Uniform Kiln Feed**—Less than 6/10 of 1% CaCO_3 variation.

Write for reprints of technical papers giving actual plant results and costs.

FOR DORR CEMENT C. C. G. (CLOSED CIRCUIT GRINDING)

★ This is the biggest and toughest Dorr Bowl Classifier ever built—over 50 tons of extra heavy construction for a new white cement operation in the East.

It will operate in Dorr C.C.G. (closed circuit grinding) with a large wet ball mill. Its 99 percent minus 200 mesh overflow product will be concentrated to slurry density in a Dorr Thickener ahead of the rotary kilns.

The Dorr C.C.G. System, grinding from 90-99 percent minus 200 mesh, requires only 3-4 KWH per barrel for raw grinding. This low power consumption is $\frac{1}{2}$ to $\frac{2}{3}$ the average for the cement industry.

Dorr C.C.G. pays for itself out of power and other savings. It helps produce a stronger and sounder cement through uniform fine grinding and the elimination of tramp oversize in the kiln feed.

This better wet grinding system has been adopted since 1935 by practically all new wet process mills having capacities ranging from 2500-16,000 barrels per day.

DORR
RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE



THE DORR COMPANY, INC., ENGINEERS

NEW YORK, N. Y. 570 Lexington Ave.
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WESTPORT, CONN.

SUGAR PROCESSING
PETREE & DORR ENGINEERS, INC.
570 Lexington Ave., NEW YORK

170,000 Tons
in 4½ Months

TELSMITH PLANT

speeds
construction
of Army
Ordnance
Works



★ For the new powder bag-loading plant at the New River Ordnance Works near Radford, Va. 300,000 tons or more crushed aggregate will be required. To supply it the Pendleton Construction Corp. of Wytheville, Va. with the co-operation of Telsmith engineers built a new crushing plant near Dublin, Va. It is Telsmith equipped throughout!

Actual crushing began March 13, 1941, and by the end of July, 170,000 tons of aggregate had been turned out. The capacity naturally varies—from 150 tons to 100 tons per hour—depending upon the sizes produced. Six different sizes of finished products can be made.

The plant amply demonstrates Telsmith planned production. Properly co-ordinated and balanced, all units are working smoothly—giving flexibility as to sizes, and dependency as to quantity and quality of product. That's as typically Telsmith as the low cost per ton.

Each of the three Telsmith Crushers (Jaw, Gyrosphere, Roll) is driven by its own Diesel. A Diesel-electric generator supplies current for the individual electric motor drives on the Telsmith Apron Feeder, the two Telsmith screens and the four Telsmith-Barber-Greene Steel Frame Belt Conveyors.

For details on Planned Plant Production by Telsmith—get Bulletin Q-11.



Under hopper, 36" x 12" Telsmith Heavy Duty Apron Feeder delivers to 24 x 36 Telsmith Roller Bearing Jaw Crusher.



Telsmith 4' x 12' two-deck Pulsator over small loading bin. Rejects from the top deck are crushed by the Gyrosphere.



No. 48 Telsmith Gyrosphere, in closed circuit with 3-deck screen, crushes the top deck rejects.



4' x 12' Telsmith 3-deck Pulsator over main storage bins, grades stone into three sizes.



Surplus in main storage bin, of any size, is crushed to smaller sizes by 30 x 18 Telsmith Roll Crusher.

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

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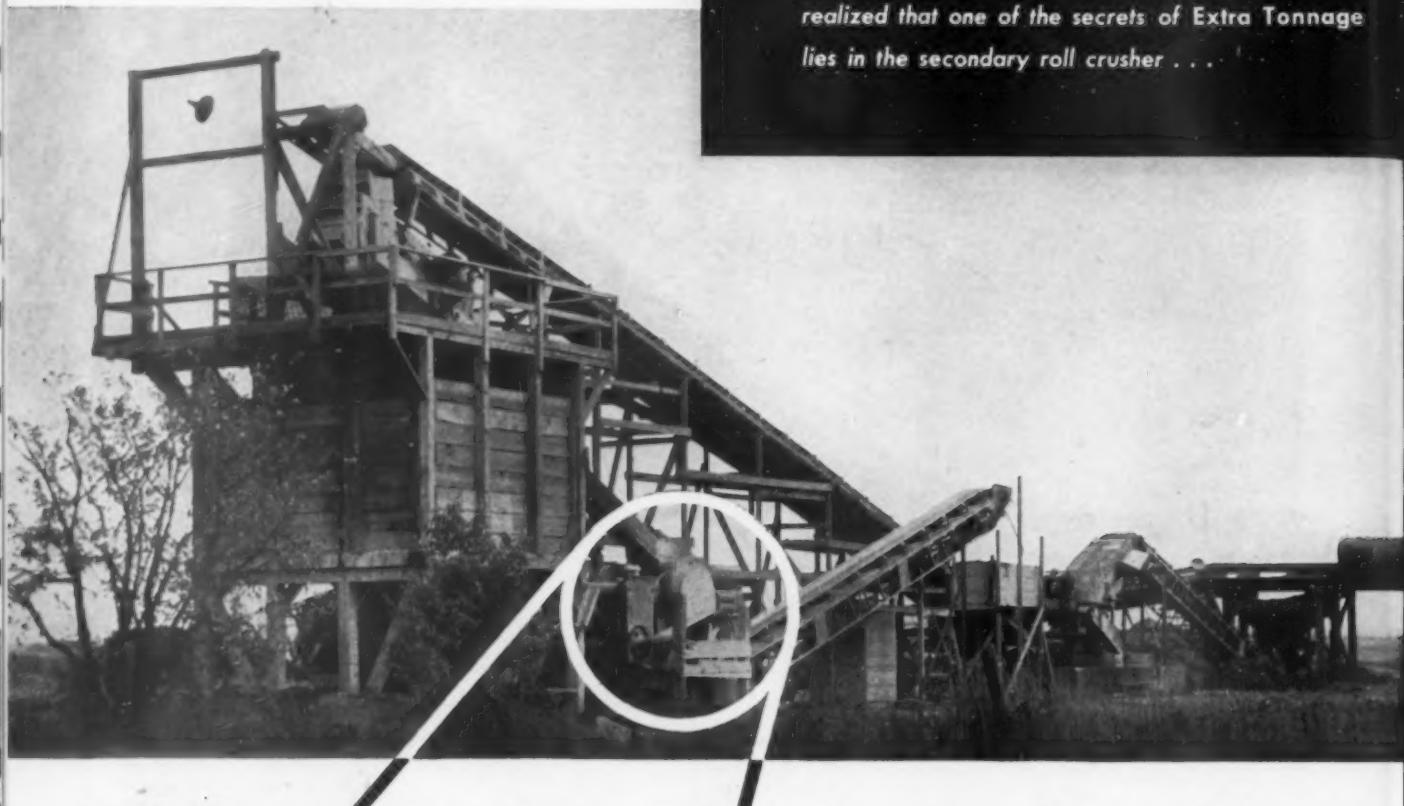
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Toronto, Ont.

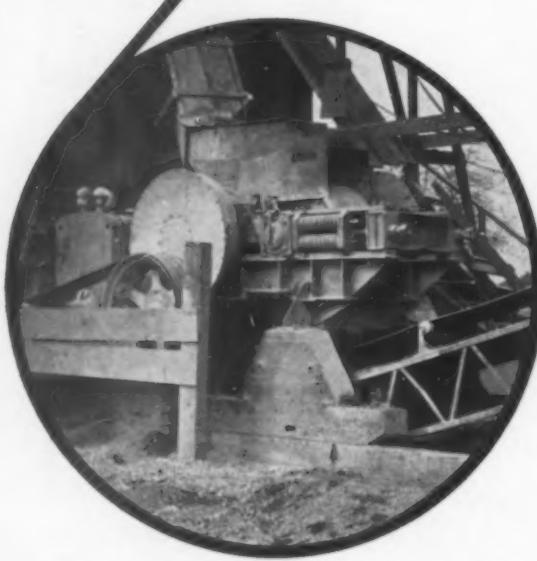
PIONEER

Foto Facts ... No. 13

To build Eugene, Oregon, airport, contractors E. C. Hall of Eugene and J. C. Compton of McMinnville, Oregon, were going to need crushed rock . . . lots of it, and in a hurry. In building their plant, they realized that one of the secrets of Extra Tonnage lies in the secondary roll crusher . . .



Aggregate, in a hurry, for Eugene, Ore., Airport



Construction of strategically situated Eugene Airport involves some three miles of runways and taxiways surfaced with asphaltic concrete. It's a \$400,000 contract that's roaring along with all possible speed, and contractors Hall and Compton have every right to be proud of their crushing plant's performance.

In one stretch of 600 hours the plant averaged 92 tons per hour, and for the entire job an average of close to 90 tons per hour has been established. A Pioneer 40x22 roll crusher in the secondary is one of the secrets of this crushing plant's tonnage. It takes the oversize from a Pioneer 3x10 double deck screen and crushes to the finished product size.

The Pioneer 40x22 roll crusher is extra heavy for the tough jobs. It has manganese steel shells 40" in diameter and 22" face — all gear drive — spring release for safety — and positive adjustment.

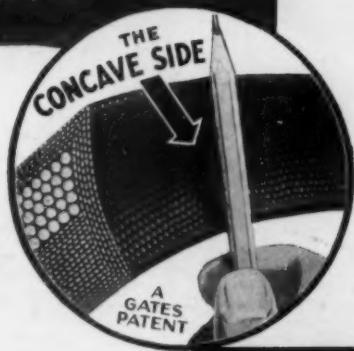
Upper Photo: General view of crushing plant at Eugene Airport
Lower Photo: Close-up of Pioneer 40x22 roll crusher

FOR FURTHER INFORMATION WRITE, WIRE OR PHONE

PIONEER ENGINEERING WORKS, INC.
1515 CENTRAL AVENUE • MINNEAPOLIS, MINNESOTA



**Make This Simple Test
It Will Show You A REAL SAVING
in Belt Costs!**



As a V-belt bends, you can actually feel its sides change shape! The top of the belt is under tension and grows narrower (see Figure 1, at right). The bottom is under pressure—therefore it widens. These stresses force a straight-sided V-belt to bulge in the sheave groove (Fig. 1), and this produces uneven wear on the belt sides, resulting in shorter life!

Now look at Figure 2. There you see how the concave side of the Gates Vulco Rope exactly corrects this bulging. It insures a perfect fit in the sheave groove with uniform side-wall wear and, therefore, longer life! It insures that the entire side-wall grips the pulley—heavier loads are carried without slippage—belts are saved and power consumption reduced.

Only belts built by Gates are built with the Concave side, which is a Gates patent.

**What Happens
When a
V-Belt Bends**



FIG. 1



FIG. 2

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO DRIVES

Chicago, Ill.
549 West Washington

New York City
215-219 Fourth Avenue

Birmingham, Ala.
405 Liberty National Life Bldg.

Los Angeles, Cal.
2240 East Washington Blvd.

Denver, Colo.
609 South Broadway

Dallas, Tex.
2213 Griffin Street

Portland, Ore.
333 N. W. 5th Avenue

San Francisco, Cal.
2700 16th Street



MANHATTAN IS ENLISTED UNDER THE EAGLE'S BANNER

This war will be won by Offense, not by Defense. The transition is under way through the mobilization of every strategic material, of every man, and every machine in production for war—huge production dedicated to the single purpose of Victory. In the strategic materials, rubber shoulders a great responsibility—a responsibility which CONDOR and MANHATTAN have long been qualified to assume.

But the responsibilities of quality, capacity and performance have been tremendously complicated by a scarcity not yet fully emphasized by restrictions on tires and other consumer items made of rubber.

Industry turns on rubber; it pumps, drives, controls and conveys with the aid of rubber in the form of hose, transmission belting, diaphragms, conveyor belts, and thousands of others. Planes, tanks, trucks, ships, submarines, all require rubber—rubber in the very forms and capacities which MANHATTAN has developed through the years the better to serve both industry and our armed forces.

It is no longer a matter of diverting part of the supply to the requirements of war production and prosecution, but of allocating all the rubber to the single objective of Victory.

"Priorities" sits in the swivel chair and determines how much, how soon, to whom means not only the quantity which may be obtained, but already the amount and kind of rubber (natural, reclaimed and synthetic) which may be used in manufacturing a given product.

The edicts of necessity are being accepted everywhere with understanding because patriotism expresses itself in cooperation toward the common cause of Victory.



THE MANHATTAN RUBBER MANUFACTURING DIVISION
of RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES and FACTORIES . . . PASSAIC, NEW JERSEY

To say "greater care means longer wear" is not enough. MANHATTAN sales engineers are prepared to go over your plant to show how to get the maximum wear and service out of your MANHATTAN Rubber Products—thereby fewer interruptions to thereby fewer that will speed the production of Victory.

war is hell



on Roads!

Roads don't have to be in combat zones to get "shell holes"—abusive wear of extra heavy trailer-truck traffic and the movement of army vehicles have to be reckoned with.

Too, road men have a greater obligation today than ever before, *because the rubber shortage demands the conservation of every tire*, and that means careful maintenance both of arterial highways and feeders.

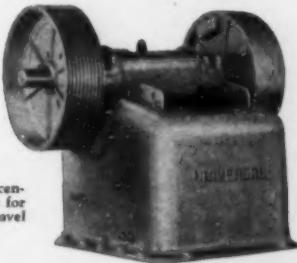
The tremendous cost of war preparation necessitates economies in normal public works—that's where Universal Crushing Equipment comes in: the greater output it provides minimizes the amount of equipment needed for producing road materials; the weight-saving Rotavator (rotary elevator) Streamlined Crushers developed by Universal engineers reduces wear and tear on roads when portable plants are in transit; and the sound construction, as exemplified by the 6 massive roller bearings on the big quarry crushers, effect savings that road building contractors and commissioners alike cannot afford to overlook.

Let us give you cost and operating facts!

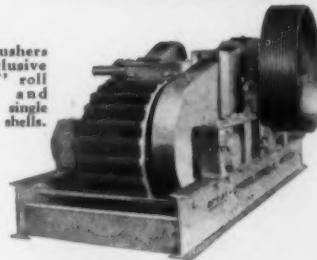
UNIVERSAL CRUSHER COMPANY

617 C Avenue West

Cedar Rapids, Iowa



Overhead eccentric crushers for rock and gravel
—26 sizes.



Roll Crushers with exclusive
"2-in-1" roll shells and
standard single diameter shells.



Portable Gravel and Quarry Plants for every
requirement.

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADER ROLLERS, PORTABLE ASPHALT PLANTS

"We saved \$5000 last year by following Gulf Engineering Recommendations"

SAYS THIS QUARRY SUPERINTENDENT



*"BEFORE WE CALLED IN A GULF
ENGINEER, THE MAIN BEARING ON
THIS BIG CRUSHER HAD TO BE RE-
PLACED EVERY 3 MONTHS. SINCE THEN
IT HAS LASTED A YEAR, AND THERE
ARE STILL NO SIGNS OF FAILURE."*

THIS big crusher gave us a lot of trouble from the first day it was installed—until we called in a Gulf engineer and followed his recommendations," says this quarry Superintendent. "The main bearing had to be replaced every three months, at a total cost of over \$5000 a year. With Gulf H. M. Grease and a change in the grooving of the bearing—as the Gulf engineer advised—we put an end to this expense, and there are still no signs of bearing failure after a year of trouble-free service."

Though Gulf engineers do not secure such outstanding results in every case, this is an example of how the

Gulf engineering organization is geared to help production men in the present emergency. *Your* plant or quarry, too, should get the benefits of the best lubrication practice. Investigate—call in a Gulf engineer today. His thorough training and broad practical experience with equipment similar to yours can go right to work for you as soon as you say the word.

The services of a Gulf engineer—and the Gulf line of 400 quality oils and greases—are quickly available to you from 1200 warehouses in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

**GULF OIL CORPORATION
GULF REFINING COMPANY**



**GULF BUILDING
PITTSBURGH, PA.**

ROCK PRODUCTS

The Ideal Grinding and Separation Combination . . .

Sturtevant

While Sturtevant Ring Roll Mills and Air Separators are widely used in the non-metallic minerals field as individual units, they have also proved themselves in many cases to be the *ideal combination for a closed circuit system*.

RING ROLL MILL for medium and fine reductions (10 to 200 mesh) works equally well with hard or soft materials, takes lots of punishment over a long life, and uses little power.

AIR SEPARATORS bring you (1) Range of fineness from 40 to 350 mesh, (2) Capacities of $\frac{1}{4}$ ton to 50 t. p. h., while increasing mill capacity as much as 300%, (3) Controlled specific surface area, (4) Lowered mill and product temperatures.

Check up on the *proved* Sturtevant grinding and separation equipment which best fits your plant . . . through a reliable Sturtevant Engineer.

Write us

Sturtevant Mill Co.

HARRISON SQUARE

Boston Massachusetts

- AIR SEPARATORS
- RING ROLL MILLS
- JAW CRUSHERS
- ROTARY FINE CRUSHERS
- CRUSHING ROLLS

AIR SEPARATOR



and RING ROLL MILL



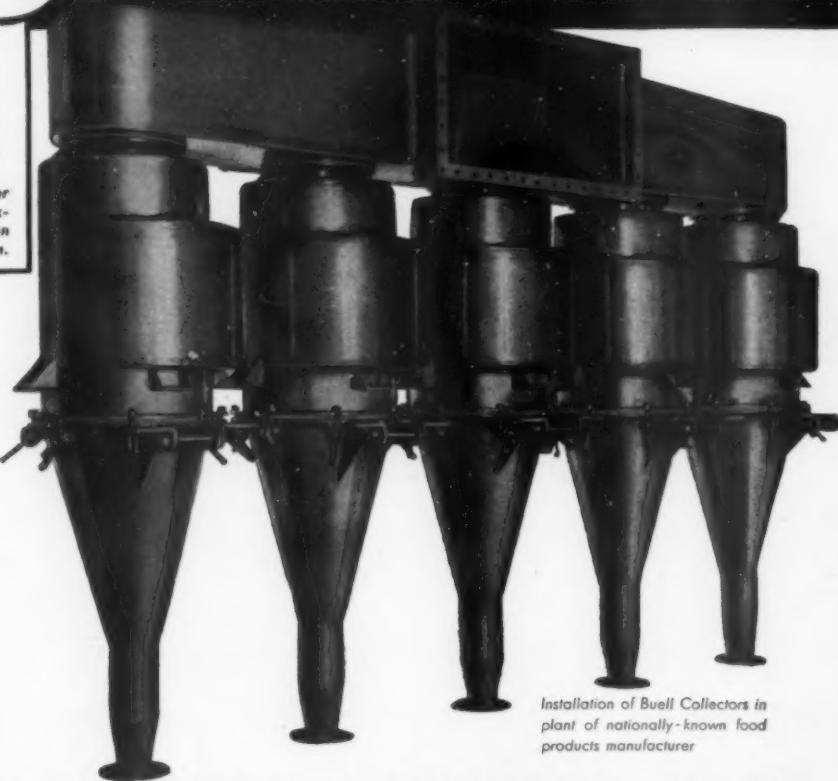
STURTEVANT

- SWING-SLEDGE
- MOTO-VIBRATING SCREENS

"Double Eddy" says:



★
Symbolizing the harnessed power
of the double eddy current—an ex-
clusive advantage of the Buell (van
Tongeren) Dust Recovery System.



Installation of Buell Collectors in
plant of nationally-known food
products manufacturer

BUELL GAVE THE MOST ACCURATE GUARANTEE KNOWN

Buell's "fractional efficiency" guarantees are famous for their accuracy. Briefly, they are guarantees to collect a definite percentage of the dust particles of each size—a guarantee that holds regardless of the inevitable and continual changes in particle size distribution that make it impossible ever to give an unqualified overall efficiency guarantee. Buell's guarantees are conservative and actual performance usually betters the guarantee.

For a typical installation, here are guarantees and actual performance:

Particle* Size in Microns	Guaranteed to Collect	Actual Collection
0 to 10	61%	63.2%
10 to 20	92%	92.6%
20 to 30	98%	98.5%
30 to 43	99%	99.4%
plus 43	99.5%	99.8%

*Specific Gravity—2.0

May we send you a copy of our special bulletin "Fractional vs. Overall Efficiency Guarantees"? Simply request it on your letterhead.

BUELL'S 6 PLUSES

Buell (van Tongeren) Dust Recovery Systems offer every user these six plus advantages...

- High Recovery Efficiency
- Low First Cost
- Low Maintenance
- Unlimited Capacity
- Long Life
- Fractional Efficiency Performance Guarantees

...all good reasons why so many of America's leading industrial concerns prefer Buell.

CONSULT BUELL *First* IN DUST RECOVERY

for Chemical • Rock Product • Metallic • Food • Flue or any other dusts







Rock Products

309 WEST JACKSON BOULEVARD
CHICAGO, ILL.

April 1, 1942

Dear Subscriber:

Washington, D.C.: The Farm Security Administration makes loans to farmers to pay local taxes, including poll taxes. Bankers say, if the new Federal income tax program goes through, the Federal Government will have to loan corporations money to pay their taxes, directly through R.F.C. or indirectly through commercial banks and the Federal Reserve Banks. To a mere layman it looks like a queer merry-go-round.

Boston, Mass.: We are going to continue to harp on the possibility of repair and maintenance machine shops in the rock products industry taking on some kind of war work. We heard recently about a New England marble machinery manufacturing enterprise that was desirous of converting its plant to the production of metal-working machinery. The management was told that its workers would find it impossible to switch over because their machines were adapted to working to 1/16 of an inch. But at present their planers are working down to a "tolerance" of .002 of an inch, which is "just what the doctor ordered" in the type work expected by the government. We would like to hear about conversion of some of the shops in the rock products industry. Donald M. Nelson, chairman of W.P.B., would too. He has asked for lists of conversions of this kind.

Washington, D.C.: Appropos of the loss of Dutch East Indies, the principal source of American crude rubber supply, and the proposal to find a substitute by culture of the guayule shrub in our Southwestern States, it developed at a Congressional hearing some time back, that the Intercontinental Rubber Co., which is already trying to raise guayule on a commercial scale, is owned 63 percent by the Nederlandsche Administratie en Truskantoor, of Holland. The Dutch Government in exile in London controls this trust, and the Dutch minister in Washington holds the voting proxy.

Philadelphia, Penn.: The demand for scrap iron and steel, and patriotic desire to supply it, apparently are doing for the portland cement industry something the N.R.A. attempted to do - causing the dismantling of obsolete plants. Lehigh Portland Cement Co., Allentown, is dismantling several obsolete plants and structural units which are expected to yield 5000 tons of scrap for use in war industries, according to A. Merritt Simpson, regional coordinator of the Industrial Salvage Section of the War Production Board. The scrap which will be produced, generally classified as structural, and including kilns, grinding units, dryers, and other large items, has been sold by the cement company to the Bethlehem Steel Co., which will use it in the filling of war contracts. Wrecking operations are expected to take about six months.

Chicago, Ill.: Inland Steel Co., which presumably includes its subsidiary, Inland Lime & Stone Co., Manistique, Mich., has announced "freezing" of salaries of

executives for the duration, thus setting an example it is hoped will be followed (by the President of U.S.A.?). A brief statement issued by Edward L. Ryerson, chairman of the board of directors, said in part: "The level of compensation to our executives will not be raised during the emergency. This is in keeping with the conservative policy that has prevailed with respect to compensation of Inland executives. * * * Because of the very large increases in income tax, this means that our executives will have very substantial reductions in the net income remaining after taxes * * * but they are accepting this cheerfully as their part in the general sacrifice which all must make if we are to win this war."

Birmingham, Ala.: The war seems to have put a lot of people around here in a panicky frame of mind, and I find it hard to talk about anything else. The stores are selling blackout shades; the hotels are displaying air raid instructions; the whole city is being blood-tested; and a practice blackout will be held next Tuesday. Garage space is scarce and there have been a considerable number of tire thefts. I just wouldn't leave my crate out at night from what I've heard.

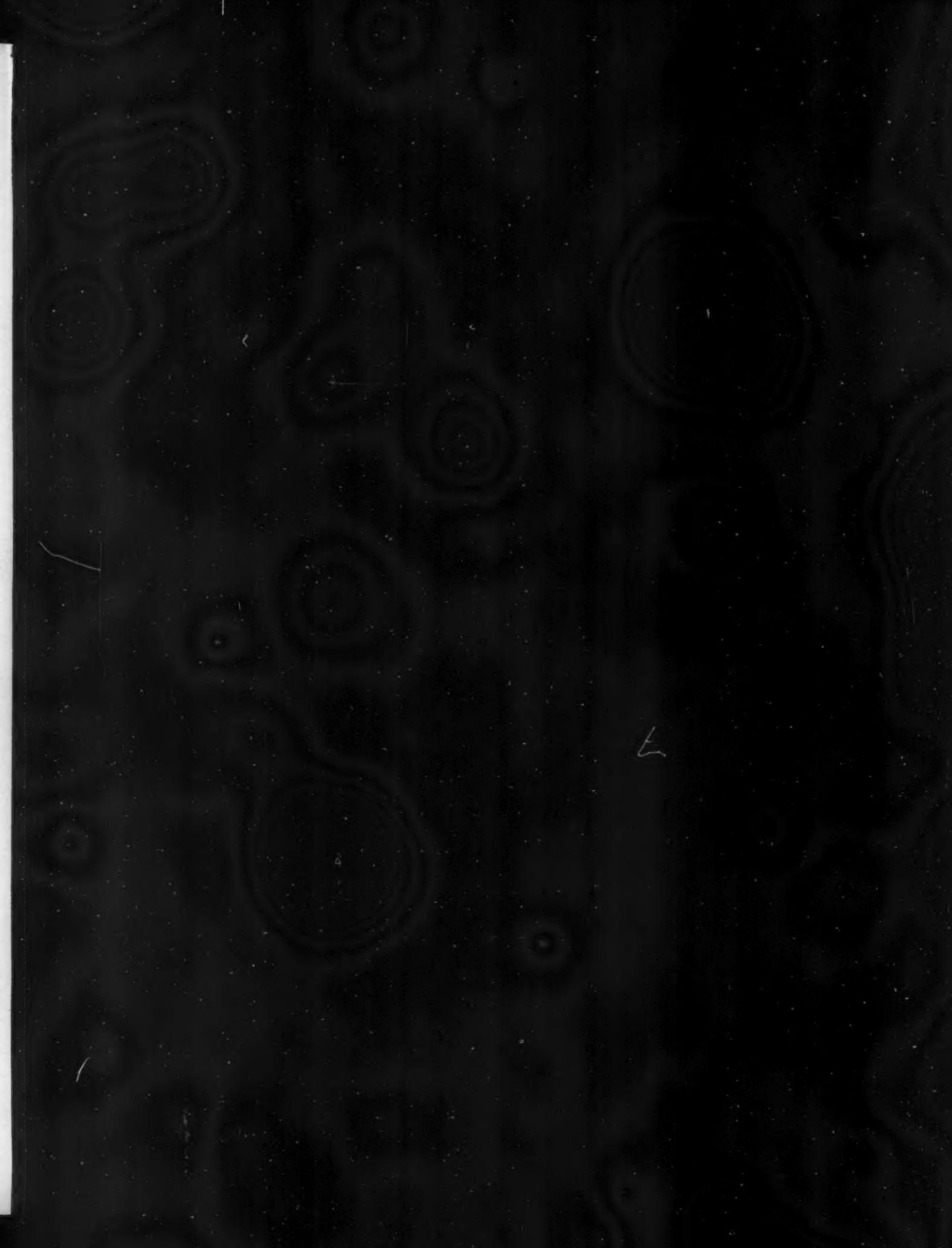
Washington, D.C.: Cement, concrete, glass, limestone, marble, wall board and mineral wool are among the "substitutes" that may be used by less essential industries, where they can, in place of critical war materials. Also available for essential civilian uses are basic low carbon steel, bessemer steel, gray cast iron and malleable iron.

Chicago, Ill.: War Production Board, Bureau of Industrial Conservation, made its first seizure of scrap metal on March 13, at Valparaiso, Ind. The junk in an automobile "grave yard" was taken over after the proprietor had refused to sell at the ceiling price. He asked \$22 per ton. He will get \$18.75, delivered at the steel mills. The seizure was made by a United States marshal and military police.

Washington, D.C.: Use in defense public works projects of steel and other critical materials needed for arms production is cut to an absolute minimum under a basic construction policy announced by Acting Federal Works Administrator Baird Snyder, III. Under the new policy, buildings constructed under the defense public works program will be limited to one and two-story masonry and one-story wooden structures. These limitations apply to schools, hospitals, firehouses, and virtually all other types of buildings provided under the program; not only those to be approved in the future, but also those which have been approved already but for which contracts have not yet been let. Wood will be used where the need appears to be purely temporary except that masonry will be recommended in all areas subject to enemy action.

Birmingham, Ala.: A mission of Chinese business men was reported recently to have inspected the operation of portland cement plants in this vicinity. From "second-hand" information, it was ascertained that the Chinese are contemplating building a cement plant underground. It probably can be done, and we presume that stack gases would be exhausted to the atmosphere through wind tunnels which would be so located as not to betray the mill location.

The Staff







This is one of a fleet of Rex Hi-Discharge Moto-Mixers operated by a Canadian sand and gravel dealer who got off on the right foot in the ready-mixed business by specifying Rex—the one high discharge truck mixer whose design was right from the start—and which is years ahead today!

RIGHT!



From the Start!

If you're considering adding truck mixers to your fleet—or if you're thinking of buying your first—we suggest you consider this:

TWO years ago, Rex Hi-Discharge Moto-Mixers introduced an end-discharging design that was a great improvement over any other on the market—a feature that has proved itself thoroughly in the field, and which has never required changing. During this time, others have come to look to this Rex end-discharging hopper as a model for their own! Consider, too, the other Rex features:

There is the Rex Hi-Lo mixing action, which in the Rex

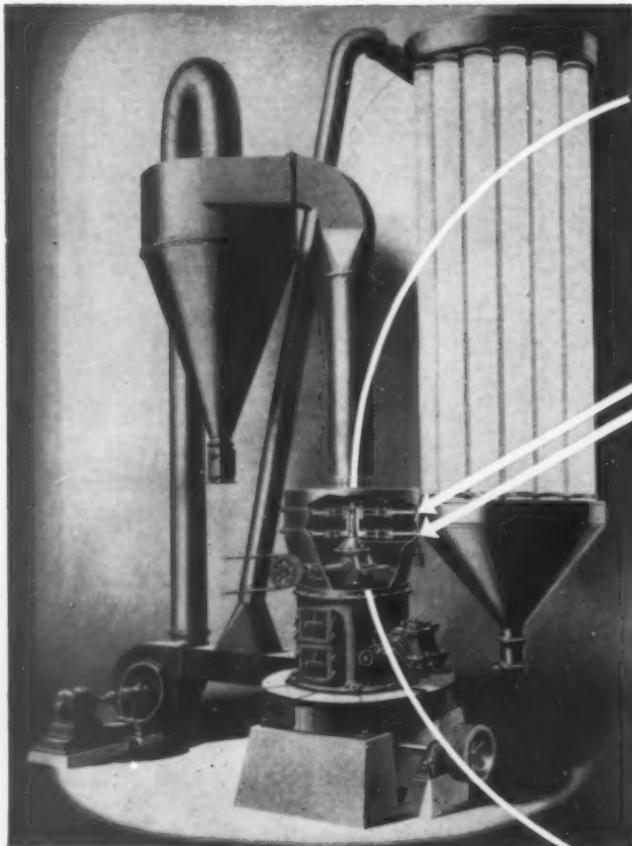
live drum means over 50% faster mixing, without "balling" or "dry-coring." There is the Rex visible mixing feature which saves inspection time—important during these days when specifications are more and more rigid. There is the Rex accurate water system—all-weather—fully enclosed against freezing.

There are other features, equally important. See the Rex man or write for the catalog, "Rex Hi-Discharge Moto-Mixers." Address: 1649 W. Bruce Street, Milwaukee, Wis.



MOTO-MIXERS
HI-DISCHARGE AND HORIZONTAL TYPES

CHAIN BELT COMPANY OF MILWAUKEE



RAYMOND DOUBLE WHIZZER ROLLER MILL

TYPICAL OPERATIONS

Drying and grinding limestone screenings

Pulverizing sulphur with CO₂ gas in the system

Grinding clay and removing impurities, mica or sand

Pulverizing resins and cooling the material in process

Are You making
SUPERFINE MATERIALS?
or...

other powdered products within a fineness range of 60% passing 100-mesh to 99.9% minus 325-mesh or finer. Then you can use the Raymond Roller Mill with the double whizzer separator, and profit by the following advantages:

1. Instant fineness control by varying the speed of the revolving whizzer while the machine is running.
2. Constant uniformity of particle size at any degree of classification.
3. Removal of surface moisture from material while pulverizing.
4. Rejection of impurities by automatic throw-out attachment.

For grinding non-metallic minerals such as limestone, gypsum, clays, chalk whiting, bauxite, barites, phosphate rock, various fillers and similar materials, you can avail yourself of lower costs and better products with the Raymond Roller Mill.



For further details,
Refer to Catalog No. 51

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1307 North Branch Street
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

ROCK PRODUCTS



Rugged durability is combined with smooth, easy handling in Bethlehem Purple Strand Form-Set Wire Rope.

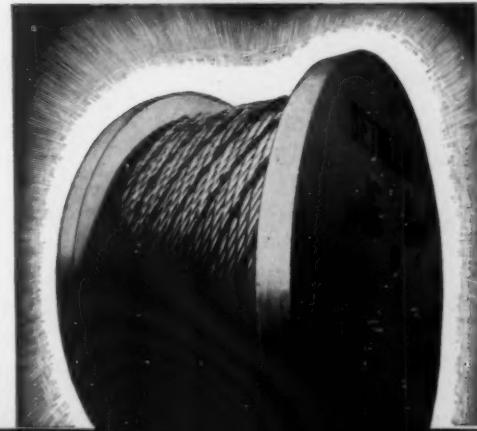
The Purple Strand means that the rope is made of 100 per cent improved plow steel—the toughest, strongest steel used in commercial wire rope.

The Form-Set (preformed) construction means that the rope is limber, relaxed, easy to handle. Can be cut or spliced without seizing. Broken wires don't bristle. The rope is unusually well able to stand bending without premature fatigue.

Next time you buy wire rope—make it Purple Strand Form-Set. You'll be getting a combination of strength and flexibility that's hard to beat.

Today wire rope is the sinew of war production. For efficiency—use Purple Strand Form-Set.

PURPLE STRAND FORM-SET WIRE ROPE



BETHLEHEM STEEL COMPANY

Clean, Safe, Silent Conveying . . .



THE FULLER-KINYON SYSTEM

The fewer moving parts that make up any piece of equipment, the more continuous service at the lowest operating cost. The Fuller-Kinyon Conveying System is an outstanding example of simplicity of design . . . one moving part . . the screw in the pump.

This screw is so constructed that it will withstand exceedingly severe service and, after long, gruelling operation, if repairs become necessary, the machine is so designed that the screw can easily be removed and replacement made in a very short time.

The conveying lines consist of standard steel pipe . . . no mechanical parts such as links, buckets, screws or drags. Nothing moves but the material and air.

Photograph above, taken during construction, shows an installation of Portland cement silos. Two main conveying lines carry the cement from the finishing mills to storage silos and bins. Distribution is made from the main lines to 52 delivery points. Compare this clean-cut, simple layout of pipe lines with a mechanical system to make the same distribution and delivery.

When you install a Fuller-Kinyon System you install a permanent system, one that will last a lifetime with the least possible repairs.

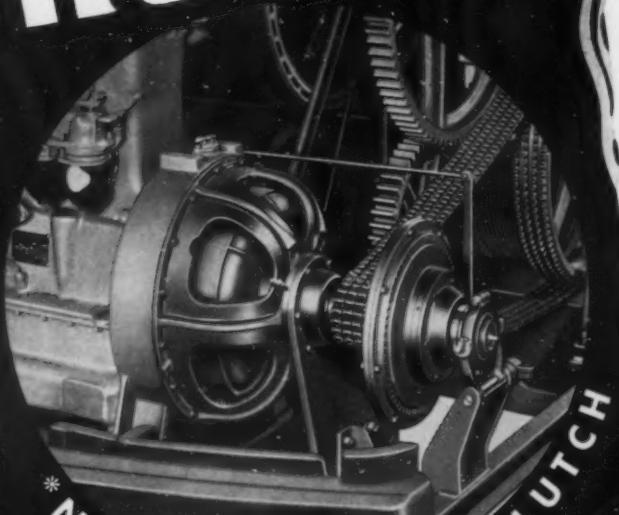
FULLER COMPANY CATASAUQUA, PENNSYLVANIA

Chicago: 1144 Marquette Bldg.
San Francisco: 390-391 Chancery Bldg.

P-50

FULLER-KINYON, FLUXO, AND AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES
ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING COOLERS . . . BIN SIGNALS

*It takes the SHOCK OUT OF ROCK



*NEW HYDRAULIC CLUTCH

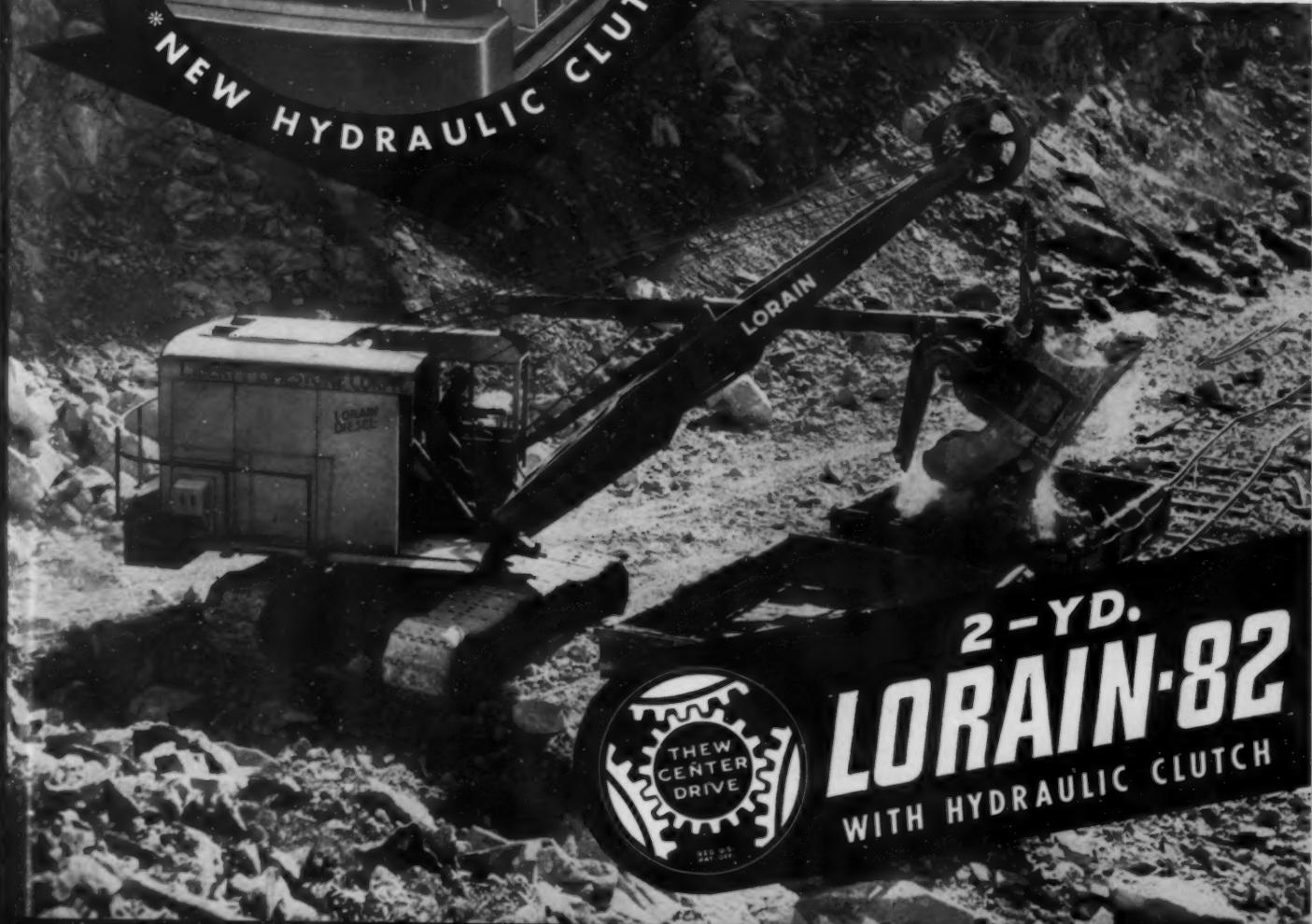
*New Hydraulic Clutch—

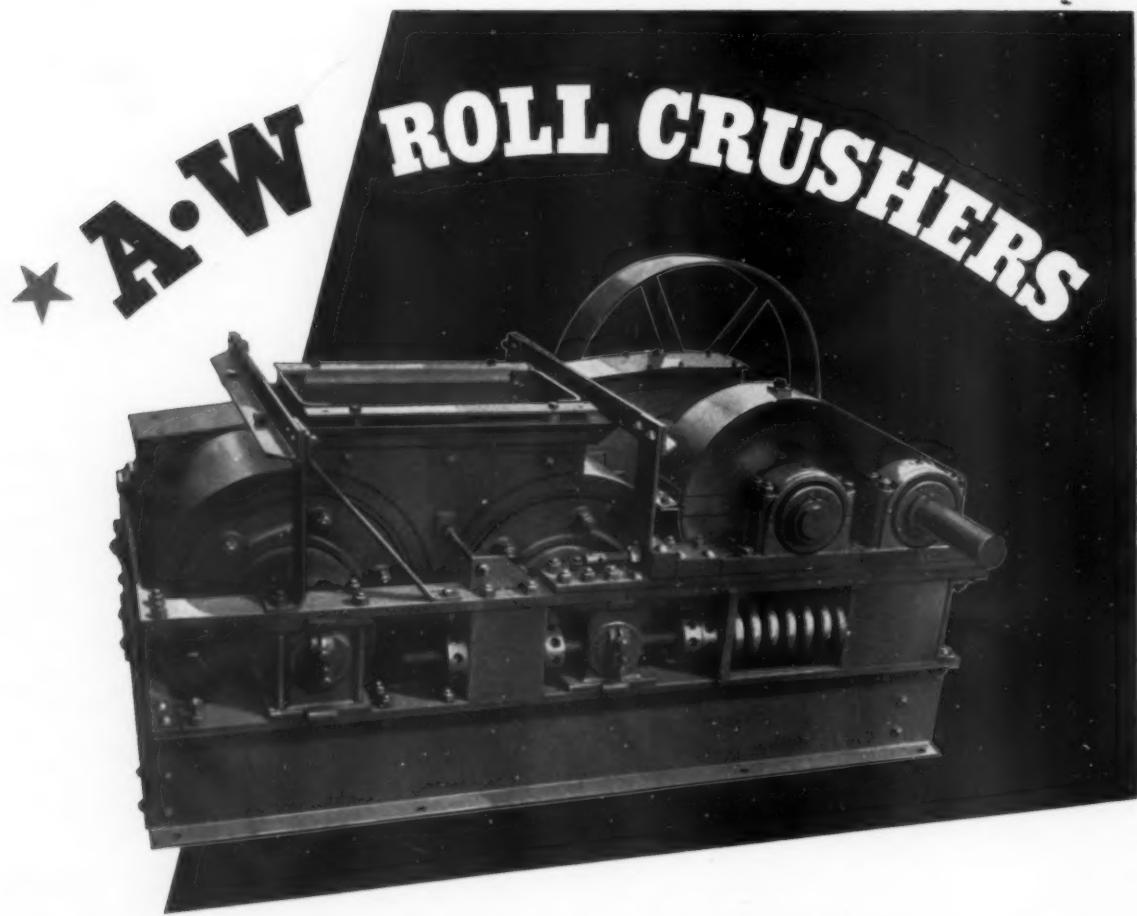
- (1) Greatly improves "hanging-on" performance
- (2) Cushions and protects against severe impacts

The 2-yd. Lorain-82, equipped with hydraulic (fluid) clutch, is the closest approach to a steam machine in smoothness and "never-say-die" power control of any clutch type unit to date. You can't stall the engine under any digging circumstances. The severe shocks and impacts inevitable with rock digging are cushioned and absorbed, eliminating costly stresses and strains on the mechanism and cables. The hydraulic coupling may be "de-clutched" and its drag positively eliminated to stop the machinery for lubrication or adjustment.

You can wade into rock confidently with a Lorain-82 with the assurance that its power and digging force will "hang on" relentlessly until the most unyielding rock is in the dipper—and at the same time the hydraulic clutch will provide an automatic check against destructive impacts and shocks. Write today for complete details on the Lorain-82 and this newest machine-and-money-saving feature.

THE THEW SHOVEL COMPANY
LORAIN, OHIO





Famous for High Continuous Output

• Engineered to operate smoothly and economically at higher speeds, A-W Roll Crushers consistently exceed the top expectations of users . . . by their steady volume production of accurately sized material.

Among the A-W Engineered features responsible for this outstanding record for continuous full load production at record low cost are: (1) Rolls mounted on stationary shafts turn on large SKF self-aligning roller bearings that prevent binding or pinching under any load; (2) Positive chain drive, that is unmatched for reliability; (3) Rolls are fitted with removable shells, assuring big time and cost savings when roller surface must be renewed. Made in 30" x 18" and 40" x 22" sizes. New hydraulic jack mechanism on the 40" x 22" unit, makes spring tension control easy and fast.

The A-W complete line of Crushing and Screening Equipment includes Jaw Crushers in 10" x 16", 10" x 20", 10" x 36", 12" x 20", 15" x 20", 18" x 38", 21" x 38" sizes, conveyors, screens and bins for both fixed and portable plants.

Austin-Western's competent staff of trained men will gladly assist in the economical solution of your rock crushing problems . . . whether they be large or small . . . whether the requirements call for a complete new plant or the addition of equipment to modernize set-ups now in use. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Ill.

Austin-Western

MOTOR GRADERS
LOADERS
BLADE GRADERS
ELEVATING GRADERS
HYDRAULIC SCRAPERS
CRUSHING AND
SCREENING PLANTS

CABLE SCRAPERS
ROLLERS
ROLL-A-PLANES
MOTOR SWEEPERS
BITUMINOUS
DISTRIBUTORS
SHOVELS AND CRANES

ROCK PRODUCTS OPERATORS' WAR ACTIVITIES

ALL SIGNS POINT to necessity for every producer and manufacturer to take stock of his part in the war program. If he hasn't any part in the war program he is not likely to stay in business much longer, until the war is successfully concluded. Fortunately, a majority, probably, of rock products producers and manufacturers are able to fill some niche in the war program.

A recent incident is particularly significant and has an immediate effect on producers in these industries. That is the change made in their priorities status, as of March 2. They are no longer entitled to blanket A-3 rating, as described at some length by Dr. Wilbur A. Nelson, administrator of mine priorities, at the recent conventions of the industries in Cincinnati, and reported in the March issue of *ROCK PRODUCTS*.

Under the new regulations our industries are still entitled to A-1-a and A-1-c ratings for emergency repair parts, replacements and supplies, A-1-a in the case of actual breakdowns or stoppages of production, and A-1-c for emergency inventory replacements as reasonable provision for expected breakdowns and stoppages. But to use these ratings they must receive approval in each individual case from Dr. Nelson's office.

The new setup permits their supplier, the machinery or supply manufacturer, to use the same A-1-a or A-1-c rating to replenish his inventory of materials of manufacture. Since the old regulations permitted only an A-3 priority to be passed on to the machinery manufacturer, this change is for the better, particularly in the case of rubber and other critical materials which could not be released on an A-3 rating. For other machinery and supplies, the mining industries now have A-8 and A-10 ratings instead of A-3.

For army and navy construction and industrial war plants, ratings from A-1-a down may be obtained for rock products plants as part of the project rating, but not until all other possibilities for filling construction material needs are exhausted. New machinery and equipment may still be purchased under the conditions described for maintenance or expansion of production, but not for labor-saving, although labor shortages are very generally anticipated.

Shortages in transportation equipment and power, as well as labor, may bring about the operation of "nucleus plants." This possibility was discussed informally at the Cincinnati conventions, but apparently operators cannot do much about it until changes are made in the anti-trust laws.

Where three or four or more plants are serving the same territory, none with full capacity business, perhaps at less than half capacity each, there is an economic waste of labor, power, materials and management talent. So, why not have one *nucleus* plant

operate to supply all needs, and shut down the others? Obviously, there are many intricate problems involved, but it would be far better for the operators concerned if they could get together and work out these problems voluntarily and equitably.

The President now has power to close any plant he deems not contributing to the war effort, and has power to denude it of machinery and equipment, to turn that machinery and equipment over to an operator who is contributing to the war effort, provided fair compensation is given the owners of the closed plant. Or, by negotiated contract, the government can concentrate its business to one efficiently operated organization.

The management personnel of the rock products industries is eminently qualified for official positions in war production plants, or for the uniformed services on any one of the many fronts where air fields, fortifications, encampments, docks, highways and many other construction projects are as necessary to a campaign as the operation of guns, tanks and warships.

Many of the plants will tie into war work directly, as for example those producing metallurgical lime and limestone, those for the production of magnesium lime for magnesium, those using rotary kilns, where cement or lime is not being made, for sintering or roasting iron ore, etc. If magnesium lime manufacturers permit the erection of many new lime plants to supply the "ore" for the Pidgeon and similar processes for recovering magnesium, with the present large surplus capacity in the lime industry, they will be just "asleep at the switch."

These things are not going to happen this year, or possibly next year, but with a long war in prospect, many present rock products operators must look forward to a part in the war program. They must consider ways and means of utilizing their plants and equipment for other things than production of construction materials. It is said a war use has been found for gypsum—possibly the manufacture of sulphuric acid. We have already mentioned the use of magnesium limes for recovery of magnesium. There are large undeveloped deposits of olivine, a source of magnesia and magnesium, in North Carolina and Georgia. There are many deposits of low grade manganese ore in the South. There are other low grade mineral ores to be prepared for treatment. Rock products plants have much of the equipment in place, at least for preliminary treatment.



Nathan C. Rockwood

READER COMMENT

Cement Workers' Attitude on Management

AIN EXCHANGE we enjoy reading each month is the *Voice of the Union Cement Lime Gypsum & Allied Worker*, which is the official organ of the United Cement, Lime and Gypsum Workers' International Union (A. F. of L.), edited by Wm. Schoenberg, general president. We were quite surprised to find the lead article, or editorial, in the March issue entitled "Should Labor Be Represented on Company Board of Directors—With Apologies to Rock PRODUCTS," by Wm. Schoenberg.

After quoting the item on page 30 in our Staff Letter, February issue, and our editorial on page 33, of the same issue, entitled "Labor's Partnership in Management," Mr. Schoenberg makes the following comments:

Have Joint Interest in Industry

"Perhaps the subject matter of the statement of 'The Staff' could be resorted to if for no other purpose than to be helpful and coöperative with such employers in the portland cement industry as seem of the opinion that their workers have no coöperative interest in the industry. Our own experiences, and it would be difficult to convince us otherwise, is that there are identical or joint interests of industry and labor in every industry. But in the light of our experience, it is apparent that industry must be permitted to work out its own salvation or, in every-day language, run its own business. By like reasoning, labor unions must of necessity be permitted to run their own business, providing it is run fairly and equitably and for the best interests of the thousands of workers employed in the industry. At least the United Cement, Lime, and Gypsum Workers International Union has followed this course and has been successful in operating an immaculately clean labor organization. It has been coöperative with the industry as a whole and has thereby been able to command the respect of the great majority of the responsible heads of the portland cement industry, particularly those who are financially interested in the industry. We have also been able to command the confidence of the many thousands of cement workers employed in this great industry,

who now are united within our International Union.

How to Settle Labor Problems

"It is our judgment that there are not more than five percent in the cement industry where the reasoning of 'The Staff' perhaps should be resorted to, that is, in that portion of the portland cement industry where the employers will delegate to some attorney or industrial relations man, or a speed-up artist, the authority to represent their interests in dealings with their workers and the chosen representatives of these workers. Invariably where the unions are permitted to meet with the responsible heads of cement companies or with general managers and general superintendents who have actually acquired the knowledge necessary for successful and practical management of a cement plant and have grown up with the cement plant, we have no difficulties in reaching common ground and finding wholesome understanding for the daily problems of the workers in cement plants and quarries; but where management resorts to the so-called legal minds, of the smart-aleck type, who feel that they must impress the workers with their authority, and are in fact convinced that the workers do not understand anything about the industry, there is where we find the root and beginning of most controversies.

When Lawyers Are Called In

"The writer remembers a particular case, where the president of a cement company informed him that he would never consider permitting his general manager to negotiate a labor agreement with the union's representative. He stated that for that purpose they had secured the services of an attorney, a man whom they charged, so he stated, with the responsibility of keeping himself familiarized with all labor laws in the state and nation. Strange as it may be, our union experienced more difficulties in our relations with that one particular company than any of the others operating cement plants in this great country, although, as a matter of fact, the particular general manager of this cement company

justly has the reputation of being one of the best cement men in the nation. He is well-liked by the workers, but the president of the company, who evidently is not a practical cement man, and perhaps never worked in a cement plant, decreed that collective bargaining in accordance with the National Labor Relations Act should not be done by the practical man, the general manager, but by the attorney, their labor relations man. So, in cases of this kind the writers of 'The Staff' may perhaps have the right solution for our organization.

Coöperative Spirit Settles Difficulties

"We remember an interesting happening a few years back when a certain ship repair yard had continuous difficulty with its workers. Hardly was a controversy adjusted when new ones arose. Strikes in that ship yard were of daily occurrence. Finally the labor organization most vitally interested gave orders through its banking facilities, to buy up the floating stock of the institution, and there came a day when the international union was in control of the majority stock. Shortly thereafter a meeting of the stockholders was held and most of the former directors were re-elected and in a subsequent meeting of the directors, the plant superintendent who was responsible for all the labor difficulties was told to go back to his job and operate the ship yards along decent, humane and friendly lines, along American lines; and within a short time a real coöperative spirit was established, and the ship yard became a paying institution not only for the workers but also for those who financed the institution.

Responsible Union Agreements

"However, the cement industry may rest assured that it is not our intention to purchase any stocks which are floating on the markets of America, for as we have stated above, we have no difficulty with any of the important cement companies in the United States. There are a few, a very few at that, who live in the last century, who cannot as yet grasp the new day, but we are confident that in due time we shall be able to convince them too that to operate a cement plant and quarry under an agreement with a responsible labor union, such as ours, is equitable as well as profitable."

READER COMMENT

Labor's Partnership In Management

THE EDITOR: In your February issue editorial on "Labor's Partnership in Management," you ask for views pro and con. I should like to express my views, but first you may be interested to know who is speaking. I am the superintendent of a lime and stone plant. I have been both laborer and employer of labor. Have worked for others and have owned a business of my own. Have had considerable experience in municipal and social affairs and am in my eighth year as mayor of the town of Stonewall. My present position as superintendent has been held for twenty-six years, during which time there have been no labor troubles in my plant. My apologies for talking about myself. This is merely to supply a background.

With your first point I am not in entire agreement. On going over the files of *Literary Digest* from 1914-18 I find some forecasts remarkably like those which are being made today in regard to the post-war period, none of which materialized. That there will be a tendency towards socialism is very probable, but we are not considering the post-war reaction. What this will be is unpredictable, but if you read English history of the times of Charles I, Oliver Cromwell and Charles II, you will have an illustration. One thing is sure; that the harder you throw a ball against the side of a house the farther it will bounce back.

Your second and third points I agree with, and also your fourth, where I would include representatives of employees whether the employees are unionized or not.

Your fifth I fully agree with.

Your sixth point is more than debatable. I have found that men are generally honest and fair, and have always worked on that belief.

I believe that the representatives of the employees should have some say in the policy of the management and should accept responsibility.

Politicians, however, are definitely out.

It is to the credit of trade journals generally that they have urged closer co-operation between capital and labor. This has also been preached at conventions, but while management has accepted this in theory there has been little effort to put it in practice.

Personally, I am an individualist. I believe that most of the good things

we have in the world have been the work of the individual, not the organization.

However, I have no fear of socialism. As Oliver Wendell Holmes says, "If you shake a bushel of potatoes in a basket the biggest ones will come to the top."

F. J. PEARSON.

Stonewall, Man., Canada.

Labor Problems In England

THE EDITOR: Having been a subscriber to your paper for many years now, I am always interested to read of, and try to understand conditions in America. However, in the editorial of your December, 1941, issue you refer to certain conditions in England, and I think that you have been somewhat misinformed.

The regulations in this country concerning essential industries are pretty much as you state, but they appear much more complicated on paper than they actually work out in practice. In general, the scheme appears to be working very well.

In your editorial you do, however, state: "One difficulty arises from the fact that these National Service Officers are also Labor Union officials." As far as I am aware, this is not the case, and I have made inquiries from official sources to confirm this. The National Service Officers are, in nearly every case, the manager and deputy manager of the local employment exchange, who are, of course, officials of the Ministry of Labor and have no connection whatsoever with the Trades Unions. One of the present duties of these officials is to arbitrate impartially between employers and employees, or their representatives, and from my own knowledge appear to carry out this difficult duty in a very fair and impartial way.

Your editorial would appear to convey that relations between employer and employee in this country are not very amicable, but as an employer of labor, I can assure you that the contrary is the case, as it is the honest endeavor of all classes to work together with the one aim—Victory. There are, of course, exceptions on both sides, but too much notice must not be paid to these.

COLIN M. KAY,
Director, LaFarge Aluminous
Cement Co., Ltd.,
London, England.

Jan. 31, 1942.

Vicious Propaganda

TYPICAL of the anti-industry propaganda issuing regularly from Washington, D. C., is the following from the *Birmingham (Ala.) Digest*:

WASHINGTON—Growing workers' efficiency in the portland cement industry has increased output per man-hour by 150 per cent in the past 21 years, a Department of Labor study disclosed.

However, the employers were shown to have gobbled up most of the benefit of this gain in productivity. Their total payrolls were found to have been the same in 1940, as in 1919, despite a vast rise in output.

The facts are, of course, that the industry has reduced the number of man-hours per 100 bbl. of cement by about two-thirds, so, if the total payroll is the same, a given number of employees for the same output gets the same total wages as would have been paid to three times that many in 1919. In other words average wages are triple what they were in 1919. The advantage to the worker has not been due to his greater efficiency but to the ingenuity of machinery designers and manufacturers and a much greater investment per man employed by the cement manufacturers. The red influence in Federal bureaus is all too obvious.

New Trucks, Tractors Trailers Rationing

RATIONING OF ALL TYPES of new trucks, truck tractors and trailers, to be administered through the joint facilities of the War Production Board and the Office of Defense Transportation, became effective March 9, under General Conservation Order M-100.

Civilian applicants seeking to purchase vehicles must show clearly on Form PD-310 that:

(1) They cannot meet their needs by leasing equipment.

(2) They cannot fill their needs by pooling their present equipment with that of other operators.

(3) They cannot transfer vehicles now being used for less essential purposes to the use for which they desire new vehicles.

(4) They cannot possibly repair the vehicle which they desire to replace.

Management Contract

NATIONAL GYPSUM Co., Buffalo, N. Y., has announced it has entered into a contract with the United States Government to supervise construction of and to manage a munitions plant "somewhere in Texas."

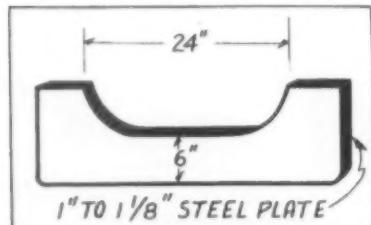
HINTS AND HELPS

Heavy Duty Chutes

By WALTER B. LENHART

AT THE SAND AND GRAVEL PLANT operated by Columbia Construction Co. at Redding, Calif., for producing aggregate for the Shasta dam, 6-in. cobbles make up a considerable portion of the material used in the bulk concrete. Anything over 6-in. is scalped off and crushed.

Where the oversized material falls from the vibrating screen to the sec-



One of the steel sections which, welded to others, forms a long wearing chute

ondary crusher, the material must make a right-angled turn, and, at the same time rock falls vertically about 6 to 8-ft. Where this material hits against the chute excessive wear would be expected. Such conventional designs as rubber lining, etc., seems to be unsuited for the heavy beating that the chute receives.

To insure continuous operation the chute at this point has been made up of steel plates from 1-in. to 1 1/8-in. in thickness. The steel plates were cut into sections as shown in the sketch. Thus, for one lineal foot of chute, (using 1-in. plate) there would be cut with the torch, 12 such sections as shown. These were then welded with the electric arc welder into a chute about 15-ft. long (including the elbow). To wear out this chute the rock would have to cut through at least 6-in. of solid metal and at the time of inspection there was no indication but what the chute would last out the life of the operation.

Reclaiming Quarry Drills

QUARRY DRILL LIFE is comparatively short due to the frequency that they are resharpened and to breakage. However, it is possible to reclaim drills that are no longer of sufficient length to be serviceable by joining two short drills to make a long one. As pointed out in *Oxy-Acetylene Tips*, the resulting reduction in scrap losses is of particular value today

because of the great demand for high-carbon drill steel. It is also possible to make extra-long drills from standard drill lengths.

At the quarry where the welding procedure was first developed, most of the work is on jackhammer drills and wagon quarry drills, either hexagonal in section, $\frac{7}{8}$ -in. wide, or round, 1 1/4-in. in diameter.

The first step is to take two similar drills that are too short for use and cut off the shank from one and the drill end from the other. The two long sections that remain, one with a drill end and the other with a shank, can then be joined to form a complete drill of the desired length. The joint is prepared for welding by machining each cut end to a bevel of 35 deg. The two sections are then lined up on a 2-in. angle iron, which is supported by V-blocks. Use of the angle iron permits easy alignment of drills of various diameters. Edges of the joint are spaced about 1/16-in. apart.

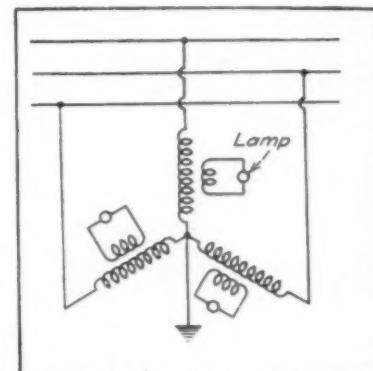
A small, continuous tack-weld is then made at the base of the vee, completely around the joint, while a helper turns the drill sections. The weld area is preheated for a distance of 2 to 3 in. back on either side of the joint so that during actual welding the weld will not cool too rapidly through dissipation of heat into cold surrounding metal. The main weld is then made, with care taken to obtain good penetration with the initial tack-weld and with the side walls of the joint, which should be melted down about 1/16-in. At the same time care should be taken to avoid overheating the metal, which would be indicated by sparks.

As soon as the weld has been made and before it has had a chance to

cool, the drill is removed from the angle-iron support, checked for straightness, and replaced in the angle iron. The area on either side of the weld is then reheated to assure the slow cooling necessary to achieve a ductile, shock-resistant weld. No weld finishing is necessary.

Grounds Detected by Signal Lamps

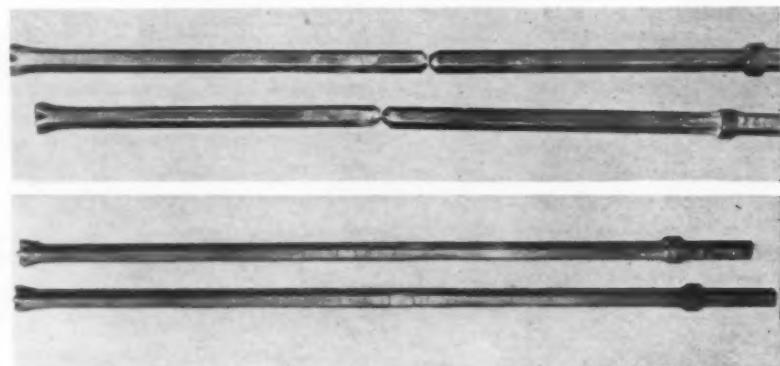
SOUTHERN PHOSPHATE CORP., Bartow, Fla., has devised an interesting visual means of detecting grounds on a 2300-volt distribution system to motors and transformers. A recent issue of *Engineering and Mining Journal* described and illustrated this system which undoubtedly may have other applications in the rock products industry. The diagram of electrical connections of potential trans-



Wiring diagram of potential transformers and ground-detecting lamps

formers and ground-detector lamps used at each of the 33,000- to 2300-volt transformer substations is shown herewith.

Secondaries of the power trans-



Above: Two short drills (shank from one and drill end from the other) are beveled before welding. Below: Completed welds. No finishing is required

HINTS AND HELPS

formers are connected in delta. When the line voltage is 2300 and the system is free of a ground, each lamp is lighted at 64 volts. However, if a conductor becomes grounded, the lamp powered by the potential transformer connected to that conductor dims or goes out, depending on resistance of the accidental ground. If this ground is a "bad" one, the other two potential transformers get full voltage and their lamps brighten by getting 110 volts.

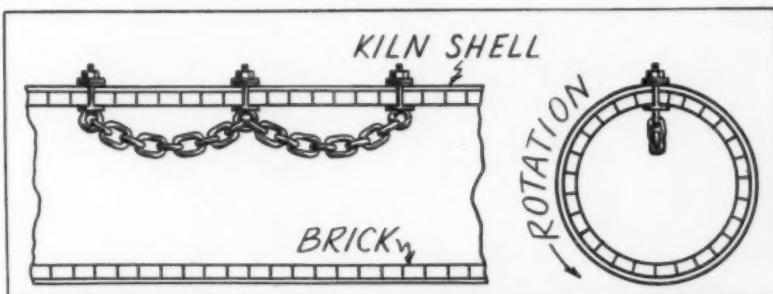
Preventing Lime-Kiln "Clinker Rings"

A KRAFT PAPER MANUFACTURER who operates his own rotary kilns to make lime used in the production of pulp, experienced trouble with the formation of a sintered ring of lime about 30 ft. from the burner. This crust builds up to a point where it decreases the cross-sectional area of the kiln to the extent that material will not flow satisfactorily and the velocity of the gases in the kiln is increased, resulting in a reduction in efficiency of operation.

By joining strands of Amsco Alloy F-10 chain, to three I-bolts fastened to the kiln wall, a suspended chain is formed which "flops" around as the kiln rotates, tending to break up any crust that might form.

A repeat order indicates that the experiment worked out satisfactorily.

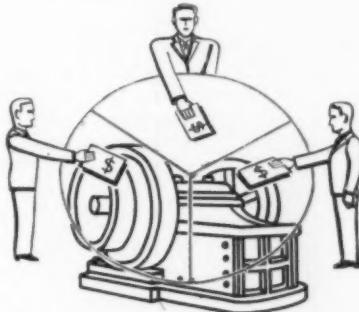
While this application is out of the ordinary, it is one of the many ways in which Amsco Alloy can be used to lower operating costs where heat, corrosion and abrasion must be contended with.—*The Amsco Bulletin*.



Arrangement of chains in rotary lime kiln to prevent "ring" formation

Provision for Crusher Repair Parts

THREE CRUSHED-STONE COMPANIES, located not far apart, hit on the following scheme to provide for emergency repair parts for 48- x 60-in. jaw crushers, each of which com-



Three companies own one spare crusher

panies operates one. Because of a replacement one of these companies was able to set aside as a reserve the older, worn crusher. This company

and the two others then "purchased" this old crusher, putting up one-third each of the agreed upon price, which fund goes into a common "treasury." The old crusher is to be preserved intact until replacement parts are required by any one of the three companies, for the three crushers kept in operation.

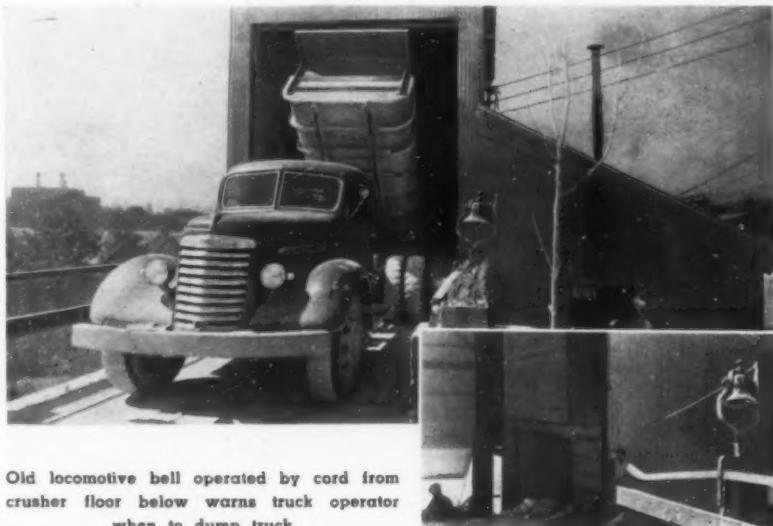
The first one that needs the part will get it, and an order probably will be placed for a new part for the reserve crusher. The company that takes the part will pay for it at a price proportionate to the value originally placed on the whole crusher. When the whole is used up each company will get back its original one-third investment; or if the crusher is sold they will split "the take."

There appears to be nothing wrong with such an arrangement and it gives reasonable insurance against stoppage of any one of the three operations because of delay in replacement of a repair part—providing, of course, that the same part does not require replacement in all three crushers within the period of months anticipated necessary to get a new repair part. The odds are certainly against such a catastrophe.

Bell Signals Truck Driver To Dump Into Crusher

OHIO MARBLE Co., Piqua, Ohio, has a very simple but effective arrangement to signal the truck driver to dump his load into the crusher below.

As shown in the illustration, the end-dump truck dumps the load of stone from the ramp above into the crusher below. The crusher operator signals the truck driver when he wants the truck dumped by pulling a cord which is attached to an old locomotive bell mounted near the truck driver's cab. This arrangement eliminates the necessity of the truck driver leaving his cab.



Old locomotive bell operated by cord from crusher floor below warns truck operator when to dump truck

NEWS ABOUT PEOPLE

Author of Series on Kilns

RALPH GIBBS, consulting engineer, York, Penn., and the author of a new series of articles in *ROCK PRODUCTS* on efficient rotary kiln operation, has had an interesting background



Ralph Gibbs

of experience. He was born September 18, 1898 in Gloucester, N. J., moved to York, Penn., from Peterboro, Ont., Canada in 1905, and finished the public schools at York in 1917. Mr. Gibbs graduated from the Pennsylvania State College with a B.S. degree in Electro-Chemical Engineering in 1921. He was employed by The York Ice Machinery Corporation from 1922 to 1934, and acted as chief chemist for 11 years. In 1927, he took part time post-graduate work in Physical Chemistry at Johns-Hopkins University. During this period (1922-1934) he was co-author of the book "Water for Ice-making and Refrigeration, and also wrote articles for the technical press. He became a member of the American Chemical Society about 1932.

In 1934 he went to work for J. E. Baker Co., York, Penn., manufacturer of lime, dolomitic refractories, and crushed stone producer. His initial work was in connection with the first

commercial Gillette retort type kiln and the accompanying ice plant. During his association with the York Ice Machinery Corporation, he had been sent to Toledo, Ohio with Dr. Gillette to study the engineering features of the experimental plant which was set up at Woodville, Ohio. Shortcomings of the Gillette Kiln as then designed became apparent in the Summer of 1935 and the enterprise was abandoned. Mr. Gibbs was then assigned to the J. E. Baker rotary kiln plant at Bainbridge, Penn., where some excellent results were obtained following changes made after a scientific study of the plant. When the new dolomite plant was built at Millersville, Ohio in 1939-1940, many new features in the plant design were incorporated with resulting improvement in operating efficiency.

Joins Navy

WILLIAM C. BOWERS, structural designer with the Arundel Construction Corp. and Consolidated Engineering Co., Inc., has resigned to accept a commission in the U. S. Navy. He has received an appointment as assistant civil engineer with the rank of lieutenant in the Civil Engineering Corps of the Navy. For the past year and a half he has been engaged on work at the naval airbase in San Juan, Porto Rico, and other bases in the Caribbean.

New U.S.G. Officers

WILLIAM L. KEADY, former vice-president, United States Gypsum Co., Chicago, Ill., has been elected president of the company, succeeding Oliver M. Knodle who was named chairman of the executive committee. H. F. Sadler, former general sales manager, will succeed Mr. Keady as vice-president in charge of sales.

Retiring Officers

FRED G. PHILLIPS, Boston branch manager of the Hewitt Rubber Corp., Buffalo, N. Y., has retired from active duty after 36 years of service with

the company. He is succeeded by Andrew Thompson, formerly northern New England representative of the company.

G. VAN VALKENBURG, general manager, Blue Rapids Gravel Co., and the Van Oil Co., Blue Rapids, Kansas, has retired from active duty after 30 years as a business leader. His duties will be assumed by Frank Kaul, of Holton, Kansas, who has been affiliated with these companies for several years.

Gets Defense Bond Gift

HAL G. SOURS, retiring president of the American Road Builders Association, at its Defense Highway Congress in Memphis, Tenn., was presented with a U. S. defense bond in recognition of his services during his two years as president. Guest speaker was John L. Rogers, director, division of motor transport, Office of Defense Transportation, who discussed the role of highway transportation in the national emergency. Tennessee Congressman Clifford Davis served as toastmaster and introduced distinguished banquet guests.

Working on Phosphate

DONALD S. PHELPS, consulting engineer, Harvard, Mass., is now in Florida where he is doing some special work connected with the increased recovery of phosphate for the American Agricultural Chemical Co. at Pierce, Fla.

Goes to Texas

P. B. KELLAR, formerly with the Columbus Gravel Co., Columbus, Miss., is now vice-president and general manager of Gifford-Hill & Company, Inc., Dallas, Texas. Mr. Kellar has been connected with the construction industry in Texas for about 25 years.

Change Positions

LATHAM B. GRAY has changed positions from superintendent of construction for Whiterock Quarries, Inc., Bellefonte, Penn., to general manager for Dominion Minerals, Inc., Piney River, Va.

G. W. NIELSEN, of Oakland, Calif., is now plant superintendent for Basic Magnesium, Inc., Luning, Nev.

Transferred

R. R. Cole, vice-president of Monsanto Chemical Co., is transferring his activities from Anniston, Ala., to St. Louis, Mo., where the company has its headquarters.

NEWS ABOUT PEOPLE

Warner Changes

IMPORTANT CHANGES in the general management of the Warner-American Companies, Philadelphia, Penn., have been made to streamline the organization for conditions arising from the war and to meet post-war demands. As indicated on the organization chart, the operating and sales functions have been set up into four major divisions; namely, production, distribution, sales, and research and development.

Under this policy all production operations, including engineering and construction in the Van Sciver, Terminal, Cedar Hollow, McCoy, Bellefonte, and Union Furnace plants, come under IRVING WARNER as vice-president in charge of production.

Operation of the fleet on the Delaware river, all yards and central-mix plants, all truck service, including the concrete agitator trucks come under the direction of ALEXANDER FOSTER, Jr., vice-president in charge of distribution. He will also have charge of

technical and specification work in connection with central-mix concrete, sand, and gravel.

Sales will be the province of REED C. BYE as vice-president in charge of sales, and he will be assisted by ROBERT C. COLLINS as general sales manager, a newly created position. Mr. Collins will administer and coordinate all sales excepting those of the Bellefonte division. GEORGE I. PURNELL will continue as general sales manager in charge of industrial and chemical lime and of the western territory or Bellefonte division. J. DALLAS DUNGAN succeeds Mr. Collins as sales manager of the Philadelphia division.

Research and development will be handled by a new department headed by SAMUEL M. SHALLCROSS as director. Mr. Shallcross has relinquished his position as general manager of American Lime & Stone Co., to take up his new work. In addition to the development of new products, the department will analyze operating statistics for the benefit of the executives.

Resigns Ordnance Office

JOHN D. BERG, board chairman, Dravo Corp., has resigned as chief of the Pittsburgh Ordnance Office to devote full time to his duties with his company. He was appointed last September and until a new appointment is made, Col. James L. Guion, deputy chief, will be in charge of the Pittsburgh office.

Heads Munition Plant

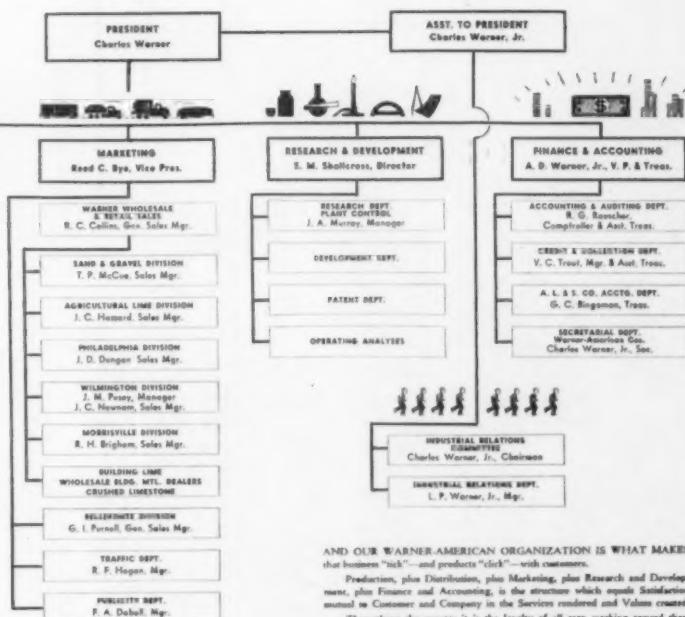
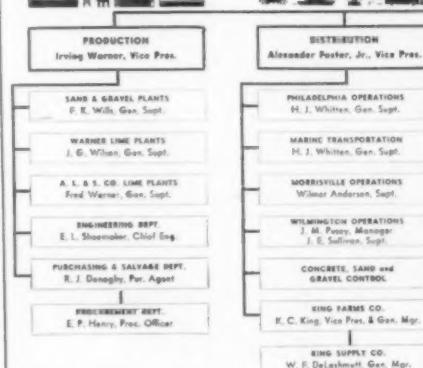
LEWIS R. SANDERSON, superintendent, National Gypsum Co., New York, N. Y., has been named general manager of the new munitions plant, called the Blue Bonnet Ordnance Plant, to be built by the Government "somewhere in Texas" under the supervision and management of the National Gypsum Co.

Enlists in Marine Corps

WILLIAM J. SIMS, sales manager, National Gypsum Co., Buffalo, N. Y., has resigned to enlist in the U. S. Marine Corps.

Picture of

HOW A BUSINESS "TICKS"...



THIS NEW ORGANIZATION CHART OF THE WARNER-AMERICAN COMPANIES shows the departmental setup and the flow of authority and responsibility starting from the President, under changes effective February 1, 1942. To most people sand is sand, and there seems to be plenty of it at the seashore. But this simple product sand, when commercially processed and marketed on a large scale, requires a thorough organization to bring it from raw deposits to consumer. The same is true of Gravel, Lime products, Central-Mix Concrete, and Vegetables, our other chief products, have also their producing and marketing complications. That is what makes business.

AND OUR WARNER-AMERICAN ORGANIZATION IS WHAT MAKES THAT BUSINESS "TICK" - and products "click" - with customers.

Production, plus Distribution, plus Marketing, plus Research and Development, plus Finance and Accounting, is the structure which equates Satisfaction mutual to Customer and Company in the Services rendered and Values created.

Throughout the process it is the loyalty of all men working toward these common purposes that brings us collective and individual success. In this process of manufacture, where do YOU fit in?

Organization chart of The Warner Co., which shows the new alignment of official personnel and the departments which they head

QUARRYING

Diesel Power for New Quarry

Crushed stone plant has a production of 350 tons per hour. Blast about one acre at a time to keep up with crushing operations

By E. U. RAGLAND*

FADED WITH THE PROBLEM of opening a new quarry in an area not readily available to cheap sources of electrical power, the Superior Stone Co., Raleigh, N. C., selected Diesel units to operate the principal crush-

This quarry was opened in Onslow County, N. C., in the summer of 1941, chiefly to supply aggregate for the U. S. Marine Corps bases being

a production of 350 tons per hour.

The deposit consists of limestone in the form of shell rock. Tests of the material show a Los Angeles Rattler loss of 42, and it has been pronounced satisfactory for concrete pavement and structures for asphaltic surface treatment as well as for macadam base for roads and runways. Overburden, which averages about 5 ft., is removed by two $\frac{3}{4}$ -cu. yd. gas shovels and an 8-cu. yd. Bucyrus-Erie pan drawn by a T.D. International tractor.

Drilling, Blasting and Excavation

Primary drilling is by means of Sanderson Cyclone No. 26 well drills with the holes spaced 25- x 25-ft. Shots are made with 40 percent Red Cross 4- x 16-in. du Pont dynamite. It is necessary to do a large amount of secondary drilling which is done with JA 45 and JA 55 Ingersoll-Rand Jackhammers. These holes are shot with 1- x 4-in. and $1\frac{1}{4}$ - x 8 in. du Pont quarry gelatine.

Compressed air for drilling is furnished by an XCB-900 Ingersoll-Rand compressor driven by a D 13000

*Secretary-treasurer, Superior Stone Co., Raleigh.



General view of Belgrade plant, Superior Stone Co. Note truck dumping stone from ramp, in background, and flume for waste water from concrete stone washing screen

ing equipment and to furnish electricity for the electric motors driving screens, conveyors, and pumps at the Belgrade plant.

built in that area. Up to about the first of the year, a total of approximately 750,000 tons of crushed stone was sold for this work. The plant has

Left: Two conveyors to screens over bins and one rejection conveyor. Right: Separate load-out station for concrete stone with 35,000-ton storage of stone for peak demands





Loading stone in quarry with a 1½-cu. yd. gas shovel and a 2-cu. yd. steamer. End-dump trucks have a capacity of 8 cu. yd.

Caterpillar Diesel while a 125 kw.a. generator driven by a ME 650 Murphy Diesel supplies electricity for the motors driving screens, conveyors, and pumps.

Three shovels, a 2-cu. yd. Bucyrus-Erie steamer, a 1½-cu. yd. Osgood gas unit, and a ¾-cu. yd. 40A Lorain, load the pit run material into 8-cu. yd. Euclid trucks which dump into a 42- x 48-in. Allis-Chalmers Superior jaw crusher, driven by a D13000 Caterpillar Diesel.

Crushing and Screening

This crusher discharges onto a 36-in. belt conveyor, 134-ft. centers, which carries the material to a 4- x 12-ft. Tyler Tyrock screen. Rejections are carried by a 24-in. conveyor, 110-ft. centers, to a 12-in. Traylor type T gyratory crusher. This crusher and an 18- x 32-in. Acme jaw type are driven by a UD 18 International Diesel. The jaw crusher is fed from the pit to make concrete stone, and its discharge is carried by a 24-in. conveyor, 148-ft. centers, to a 4- x 12-ft. Nordberg screen with 2½ decks. Water for washing the concrete stone is furnished by a 3RVH 30 Ingersoll-Rand motor pump.

While the ROC or base stone is loaded direct from bins to cars, the concrete stone is loaded by a 20-in. conveyor, 50-ft. centers, to an auxiliary siding. This gives some needed flexibility in loading as a carload every eight minutes is hard to handle on a single track.



Stone deposit following primary shot and after going over top with first round of secondary shooting. Below: Tractor and "pan" for stripping 5-ft. overburden. Note unusual smooth surface of stone deposit which permits very clean stripping



Men—For Efficient Kiln Operation

First of a series of three articles on men, material, and machinery requirements for efficient rotary kiln operation

By RALPH GIBBS*

PROBABLY no tool of industry is more abused, more misunderstood, or has more theories concerning its operation and characteristics, than the rotary kiln. Each operator, burner, or supervisor of a rotary kiln operation has his own pet theories concerning its intricate and sometimes unpredictable behavior and nature.

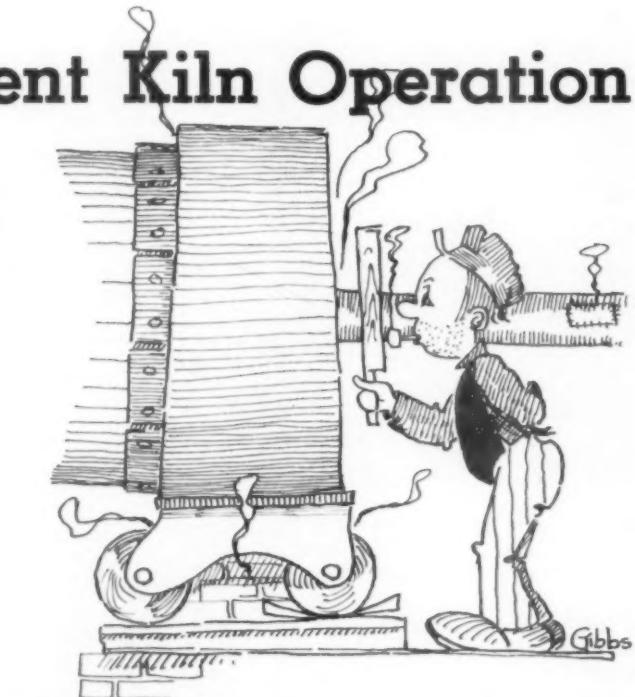
Basically, in a rotary kiln operation, we are dealing with the three fundamental elements of Industry. These are Men, Material, and Machinery. All of these must be suited to the job to be performed if the best results are to be obtained.

You will observe that Men come first, which is as it should be. Primarily we have to deal with men who are conducting this seemingly simple process of burning fuel in a rotating cylindrical tube in which mineral materials are undergoing a chemical and physical change. We have to deal largely with the personalities and the judgments of these men. Since personalities and judgment are human qualities, they are subject to influence and error. Consequently we must direct more than casual attention to these men who are directly operating the kiln or kilns. As Geoffery Martin has said, these men too frequently are given a bit of blue glass and an order to "burn her" and then are expected to do so efficiently. It just can't be done this way.

Complete Automatic Control Not Yet Achieved

It might be said by some that the judgment of men is being replaced by the use of instruments in the control of rotary kiln operations. This certainly is not true at the present time. It is true that instruments greatly

*Consulting chemical engineer. Details concerning Mr. Gibbs' career may be found in the News About People section of this issue.



assist the kiln operator in establishing his judgment of kiln conditions, but it is still essential for the operator to exercise his improved judgment. The fully automatic instrument-controlled rotary kiln eventually will be evolved, but at the present time, and for some time to come, it will be in the development stage. Until such time as this development is achieved we must rely largely upon the judgment exercised by men in the control and operation of rotary kilns.

It is most difficult to choose any particular man or group of men and attribute to him or them a particularly successful rotary kiln operation. The engineering department first must have provided suitable equipment properly arranged. The maintenance departments must keep the equipment in the best possible state of repair. The purchasing and prior operating departments must provide material suitable for use in the kiln processing operation, often with the assistance of laboratory control. Thus with these departments having properly provided for the material and equipment needs of the rotary kiln operation, it remains for the rotary kiln operators or burners themselves to produce the desired product in the most economical manner possible. In order that this may be done, we

must have the right type of man to do the job.

Developing Kiln Burners

A good kiln burner or operator is not found—he is made. Good raw material for a burner is hard to find. Generally he is developed from the raw material available in the vicinity of the plant. His development and training should not assume the proportion of a casual chore performed by an older burner or a busy foreman or superintendent. Because, eventually, upon his shoulders will be placed the responsibility of properly handling costly raw materials such as fuel, minerals, and power, as well as costly machinery and equipment. Unless this man has been properly trained, his judgment most likely will be faulty, and his resulting performance can cause the loss of many thousands of dollars.

Requirements a man must fulfill to develop into a good kiln burner are not inherent in all men. In the first place, he must be mentally and physically fit. Secondly, he must have the "eye." This means that his optic organs easily and quickly sense the different temperatures prevailing in the various zones observable in the kiln. Thirdly, he must have an aptitude for all the tasks and conditions associated

PERSONNEL

with this type of work. Fourthly, he must be always alert, quick to recognize and react when any condition of the operation so requires.

Training

It is best, generally, to start the kiln operator's or burner's training as a helper to a regular burner. By so doing, he can become familiar with the various pieces of equipment which will be under his direct care as a burner. He must become familiar with their function so he knows when they are working properly or not. He must become familiar with their construction so that he can intelligently observe and attend to those items which enter into maintenance, such as lubrication, wear, etc. As a helper he will be afforded an opportunity to observe conditions inside the kiln during the processing of the material and thus become familiar with the "burning" part of the job.

Some knowledge of what is taking place in the processing of the material is of great help in promoting a greater appreciation in the learner of what is being accomplished. The basic elements of the processes of combustion are rather easily grasped by the average intelligent person. The same can be said for the processes involved in the heating, calcining, and, finally, the shrinking or clinkering of the material being processed. Therefore the helper who is being trained to become a burner should receive some technical instruction in the chemistry and physics of the processes involved. This part of the training can be given in night classes. The presentation of the subject must depend upon the previous training of the man. In any event it must be as simple as possible, using everyday common occurrences as examples.

Organization

The position of the kiln operating department in the company organization should be definitely established. Furthermore, the kiln operating department itself should have its own definite organization setup so that the various authorities are well established and thoroughly understood by all members.

Size of operation largely determines the degree of its organization. In the case of a small operation, such as a single-rotary kiln plant, the burner might be also the foreman working directly under the plant superintendent. In such a case, the burner-foreman will have one or more subor-

dinates to whom he delegates many of the minor tasks in his department.

When a number of kilns are operating at one plant, it is deemed advisable to have a foreman supervising the kiln plant. These foremen should be experienced, seasoned men advanced from the ranks of the burners because they are outstanding burners having those qualities required of a good foreman.

In any event, the organization should be definitely set up, and the proper authority delegated. The main purpose in setting up a well defined plan of organization is to offset the human tendency to "pass the buck." Each unit has its appointed tasks and responsibilities and there is, therefore, fewer chances for alibis and excuses for doing wrong or neglecting to do the right thing, either of which can be very costly.

Operating Procedures

The human memory is very short. Ask a helper or burner under what conditions he operated his plant yesterday, and the odds are five-to-one he can't tell you. Ask a group of burners under what operating conditions they get best results, and you will get a different answer from each and every one. Ask this same question of this same group one month hence and you will find the answers differ, even to the same man giving a different opinion than before.

It is hardly possible that all these answers can be correct. If such was the case, it wouldn't make much difference under what conditions the process was conducted. Consequently there is some one set of collective conditions under which the processes involved can be most satisfactorily conducted.

The intelligent thing to do is to determine as nearly as possible just what this set of collective conditions is. This can be determined only by a systematic scheme of tests, and frequently the results obtained are extremely confusing. Occasionally the answer comes very quickly. More frequently, however, the answer is not forthcoming for weeks or even months. Perseverance is the thing. Eventually there will evolve something approaching that which is sought.

Then comes the difficult task of maintaining this procedure as that of regular operation. The tendency of the operating crews is to revert to the past ways of doing the job unless

those in charge exercise constant vigilance to hold the ground gained.

Establishment of operating procedures is extremely important in rotary kiln operation. The old method of rotary kiln operation was for each burner to operate the kiln as he saw fit, and under the conditions then existing, they did the best job they could with what they had. Today there is no valid excuse for operating a rotary kiln in this manner. It is extremely wasteful and unscientific. With a few modern instruments suitably placed, the kiln operation can be put upon a truly scientific basis, optimum operating conditions can be maintained, and the resulting benefits will be fully realized. Standard operating procedures should be developed for unusual as well as usual conditions. This pertains to rings, heavy coating and other such occurrences which interfere with the efficient operation of the rotary kiln.

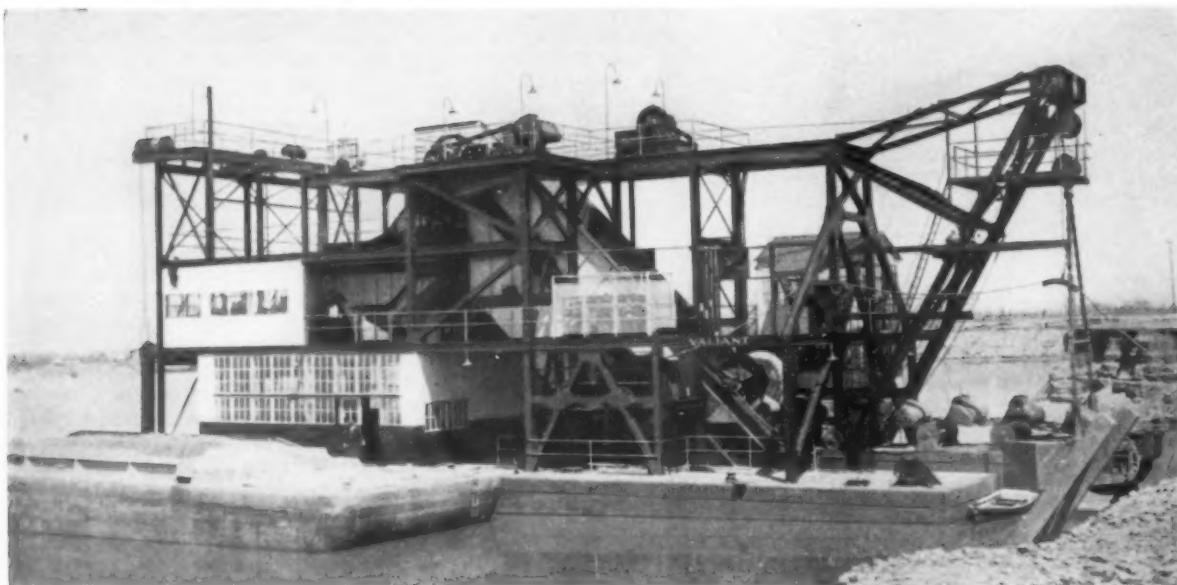
Keep Log of Kiln Operation

Especially during tests, such as those mentioned previously, is it essential to keep a running record of the kiln operation. It is only by so doing that data can be correlated. And since the human memory is so short, the best method is to make the record permanent in the form of a log. For readily apparent reasons, the burner or operator should take the readings and enter the data on the log. Furthermore, the log has the additional value of keeping the operator on the job. Most men are conscientious workers and they will make a real effort to keep their log data correct. The only way they can enter correct data on the log is to take the readings themselves. And while they are doing this they are watching the operation of the kiln and equipment.

A log, to be of any value whatsoever, must contain essential data but it should not be so extensive as to play a hardship on the kiln operator or burner in the regular attendance of his kiln and equipment. In addition to the numerical data recorded, the log should contain the date, a schedule of time records, the name of the data recorded, the name of the foreman, the remarks pertaining to items of interest concerning general observations of the entire operation. The numerical data taken will depend upon the data desired. Generally such data consist of temperatures, pressures, meter readings and material inventories.

(To be continued)

DREDGING



Starboard side of the dredge "Valiant." Note power line coming in from the bow to cable reel mid-ships

Automatically Controlled Dredge

RAW MATERIAL for the Van Sciver sand and gravel plant of the Warner Co., Philadelphia, Penn., is exploited by a continuous bucket dredge and is towed to the plant in hopper barges from which it is dug for processing by a bucket line similar to that on the dredge. The deposit is glacial drift laid down during the retreat of the last ice age when the

*Vice-president, The Warner Co., Philadelphia, Penn.

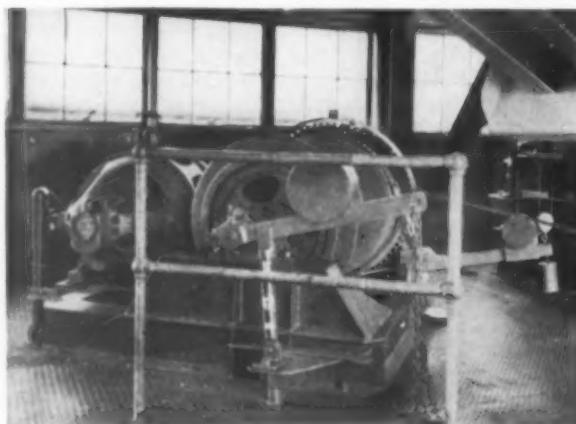
By IRVING WARNER*

Delaware River was a raging torrent from the meltage of the glacier which had its terminal morain at a point about seven miles up the river valley from the present site of Trenton, N. J. The deposit lies on the Pennsylvania side of the river within the great bend of the river below Trenton.

Terrain is almost level and the nat-

ural water level averages about 12-ft. below the surface. Underlying the deposit is the ancient Pensauken formation, a clay with mixed strata of sand and gravel. This underlying clay which determines the depth of dig is quite uniformly at a depth of 30 ft. below the surface of the water. Accordingly the deposit is a natural for water exploitation and transportation.

The dredge "Viking" was built in



Hoist for main center spud. This is typical of all hoists, showing the welded base. Hydraulic ram operates clutch release which is engaged by the weight on the lever arm



Interior of the control house with Captain Andy Kish at the levers. Hoist clutches have hydraulic control; push buttons for spuds, and drum controllers are for anchor lines and cable reel

DREDGING

1922 and during its life had dug the raw material for the production of some 20,000,000 tons of sand and gravel. It was a wooden boat and by 1939, the hard service, together with the rotting of its timbers, had begun to tell. It was still a good boat, but since it was the heart of the Warner operations, it was deemed wise to replace it.

Ruggedness and safety against fire naturally prescribed that the construction should be steel throughout. Consideration was given to the many desirable characteristics of the so-called "Western Type" of bucket line, with its lower maintenance costs, its greater ability to dig while swinging and its sustained efficiency of digging at widely varying depths. But this type of bucket line was considerably more costly in itself and required a much larger hull. Varying depth was not a factor in the consideration because of the uniformity of depth conditions in this particular deposit and the other factors were not considered of sufficient importance to justify the added cost of the Western type. Accordingly it was decided to adhere to the old type of bucket line, frequently known as the "Delaware River Type," consisting of a double chain line with buckets suspended at intervals.

A momentary capacity of 900 cu. yd. of raw material per hour was required to take care of the plant's continuous output of 850 tons per hour of finished products with due time allowance for the shifting of barges. By using the Delaware River bucket line,

this capacity was obtainable on a hull 40- x 105-ft.

Engineering of the new dredge "Valiant" was done by the Warner Company's engineering department of which E. L. Shoemaker is chief engineer and L. T. Laufenberg is chief draftsman, and under the general direction of the writer. Since the lake in which the equipment operates is land-locked, the dredge had to be constructed at the site.

Contract for the steel hull and superstructure was awarded to Welding Engineers, Inc., of Philadelphia. They began work at the site on Aug. 1, 1939, and delivered the hull and superstructure on February 1, 1940. Thereafter the Warner force took the dredge in hand and installed the machinery.

Welding Engineers, Inc., also supplied the ladder and the large central spud at the stern. The bucket line itself was taken from the old dredge "Viking." This bucket line is of interest in that the 25-cu. ft. buckets are cast as one piece of manganese steel with replaceable lip. These buckets were designed and furnished by the Taylor Wharton Iron & Steel Co., of High Bridge, N. J.

Low Head Screen Scalars Out Undesirable Sizes

In general, a dredge of this type performs no duty other than digging the raw material and placing it on a barge. However, it was felt desirable to be able to vary to some degree the

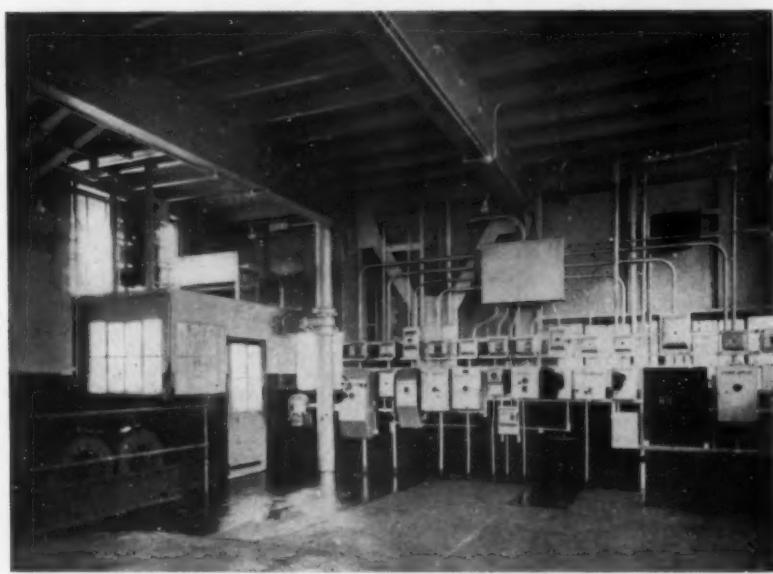
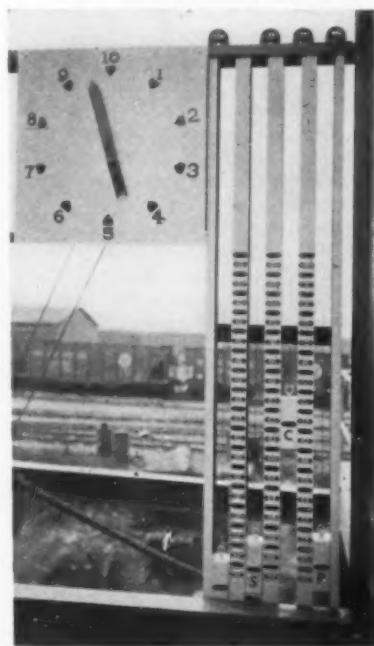


Operating mechanism of the swing. Indicator dial shown in the illustration below. By means of a weighted radial frame, the "bicycle" wheel presses on the sheave carrying the starboard anchor line and transmits its motion to the swing indicator by roller chain

proportions of sand and gravel and of various gravel sizes. To this end, a 6- x 14-ft. triple deck Allis-Chalmers low head screen was installed. The chutes are arranged so that it can receive half the total load or be bypassed altogether. Any size of gravel may be shunted overboard. In this way any unwanted size may be reduced at the source by as much as 50 percent. This was sufficient for the requirements, nor would it have been possible to incorporate in the layout in a simple manner, sufficient screen-

Left: Gauge board located directly opposite lever arm. Vertical gauges are respectively for depth of the bucket line and the three spuds. Dial indicates dredge swing

Below: Starter panel in the main deck house. Two-drum barge puller is on the left



DREDGING

Brake,	Location	Make Hoist	H.P.	Control Location	Type Control
Westinghouse	Main Ladder	Lambert	75	Control House	Wound rotor Master & 4 point Clapper Switch
Non-Reverse	Center Spud	Lambert	50	Control House	Push button Wound rotor
Non-Reverse	Port Spud	Lambert	25	Control House	Push button Squirrel Cage
Non-Reverse	Starboard Spud	Lambert	25	Control House	Push button Squirrel Cage
Non-Reverse	Port Anchor	Lambert	20	Control House	Wound Rotor Drum Controller
Non-Reverse	Starboard Anchor	Lambert	20	Control House	Wound Rotor Drum Controller
Hand	Barge Puller	Lambert	35	Loader Man	Wound Rotor Drum Controller
None Built In	Power Winch Chute Hoist		5 7½	Loader Man Loader Man	Push Button Lever

ing capacity to take care of the entire output of 900 cu. yd. per hour.

Individual hoists for the various marine services were employed instead of the former practice of multiple drum hoists. This simplified controls, and, in particular, made it

flexible couplings. This construction was only slightly more costly than the conventional open gears, since the enclosed gear sets covered all the functions of gears, shaft, bearings and gear guards.

The main ladder hoist has no clutch



Discharge end of three-deck screen. Discharge chute comprises 4- x 4-in. angles which build up with material for minimum wear

possible to have perfect fair leads for the cables. There are seven main hoists and two lesser ones as shown in the hoist tabulation.

Six of the main hoists, the ladder hoist excepted, were made in the plant shop by the maintenance crew under S. B. Johnson, superintendent of maintenance. Drums from the old Lambert hoists were mounted on structural welded frames. For the secondary reduction, enclosed gear sets were purchased from the Philadelphia Gear Co., Philadelphia, Penn. The bull pinions were mounted direct on the slow-speed shaft of the gear set and the motor direct-connected to the high speed shaft with Morse

but is operated by a reversing master controller in the control room. The motor has a Westinghouse Thrustor brake. In addition, the drum itself is provided with an automatic adjustable differential brake so that the ladder is lowered under power against the brake.

The three spud and two anchor hoists all have automatic non-reverse brakes and drum clutches for release. These clutches are of the screw thrust type and are engaged by a weight on the lever arm. Release is obtained by hydraulic control from the control room.

The hydraulic system was supplied by Vickers, Inc. The unique feature



Loading chute showing raw material flowing in with a small amount of water. The slope of the end of this chute is varied to give a cross-ship trim to the barge.

of this system is that the motor driven hydraulic pump operates at no pressure until one of the valves is manipulated. Thereupon, the free discharge is closed and the developed pressure directed to the desired point. The operating rams on the clutch levers are the standard Black Hawk hydraulic portable jacks with connections made to fit the local conditions.

Since the operation of the clutches is comparatively infrequent, the pump is not run continuously but is started and stopped by a push button conveniently located. Later this was made automatic so that when any lever was manipulated, the hydraulic pump was started and was stopped as soon as it was no longer needed.

It is to be noted that the normal condition of the clutch is in the engaged position due to the weight on the lever arms. The hydraulic system releases the clutches. Thus a safety condition is obtained in that any leakage or loss of pressure results in an engagement of the clutch and the non-reverse brake renders everything secure.

Considerable economy and simplification was secured from this hydraulic control in that the only control connections to the hoists are the electric wires and a $\frac{1}{4}$ -in. pipe for the hydraulic clutch release.

Cable leads from the various hoists were laid out with considerable care in order to lengthen the cable life. Large manganese sheaves supplied by American Manganese Steel Co. were used throughout. At no place does any cable drag.

Of interest is the indicator panel shown in one of the illustrations. This is located across the elevator well opposite the station of the leverman. Three of these show the location of

DREDGING

the spuds, the fourth shows the ladder. The dial is operated by a bicycle wheel on the starboard anchor cable.

The dredge is operated exclusively on the center spud and swing is controlled by the two bow anchor lines. This center spud is 36' x 36-in. and has a section modulus of 1500³ and alone is amply capable of resisting the bucket thrust at the maximum depth. The corner spuds are lighter and used only for emergency and when not operating. Swinging to a new cut is done by the anchor lines.

As stated earlier, the type of bucket used is not capable of swinging continuously against a slope of raw material. There is a danger of running the chain off the tail wheel. By use of

the single central spud, it is the work of only a few seconds to lift the ladder, swing the hull some 10 ft. and lower the ladder to its work again.

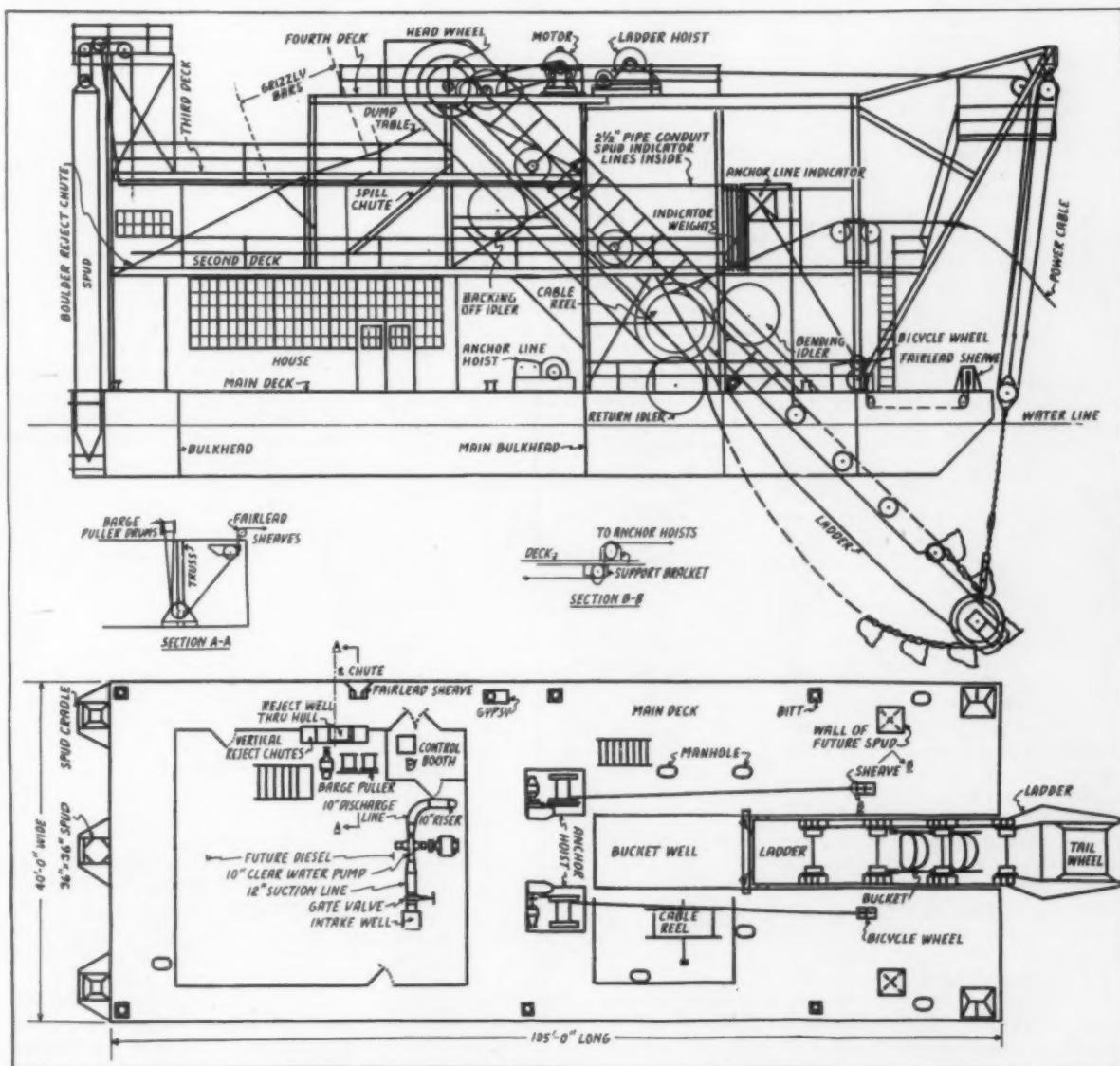
The supply of electricity comes in through a submarine cable and is wound on a cable drum on the starboard side. Power comes in as 3-phase, 60 cycles, 2300 volts, and immediately passes through the main circuit breaker and a bank of three 2300/440-volt transformers. Thereafter the power is split into two main circuits. All controls for variable speed motors operated from the control room are located in a mezzanine level immediately below the control room as seen in the illustration showing the port side of the dredge. All other motor

controls are located in the sub-station in the deck house aft. Push button control is used throughout except where speed control is employed.

The after deck house is commodious with good head room. Ample space is provided for the future installation of a Diesel generator. At present, the house contains only the starter panel along the forward wall, the barge puller, and a scattering of machine tools.

With the exception of the two pumps, wash water and bilge, all machinery is above the main deck. At certain points, cables come down to give the vertical lead necessary to a fair leader. There is an oil heating

(Continued on page 48)



Plan and elevation details of new all-steel dredge "Valiant" operated by The Warner Co., Philadelphia, Penn.

Topics for Plant Safety Meetings

Article 2: Inspecting the plant for accident hazards

OF THE MANY IMPORTANT SUBJECTS that might be chosen for discussion at plant safety meetings certainly none is more deserving of consideration than this. Continuous avoidance of mishap requires safety-minded men in safe surroundings.

Plant inspection that is sufficiently effective to insure against accidents due to defects of materials, equipment and structures as well as to their improper placing or arrangement, requires carefully planned work by experienced and trained individuals. The latter greatly need the enthusiastic interest and cooperation of all of the department heads and workmen.

In some plants inspection is considered sufficient if one or a few men browse around the premises in a casual manner every now and then. In other organizations a trip is made hasty scurry over the place in order to get the duty done with as quickly as possible. Slip-shod inspections may give a bogus sense of security for a time, but in the long run they do more harm than good.

Inspections need careful discussion and planning in advance. Some one plan is usually far superior to others. One man may be much better qualified to act as inspector than another. Inspecting at hit-or-miss intervals is not effective. Individuals competent to conduct a general inspection of a plant are not always qualified to inspect highly specialized hazards. The procedure required for faultless inspections of any plant is usually developed by thoughtful practice carefully carried out over a long period.

One of the most important objectives of the general and the departmental inspections is to train many men to quickly spot hazards that may turn up in their surroundings, equipment or working tools. Every man should be and is on guard in the perfectly trained plant organization.

Environmental accident causes are commonly divided into the following classes: improper and inadequate guarding; defective equipment and materials; hazardous arrangement; improper and inadequate illumina-

By A. J. R. CURTIS

tion; inadequate ventilation; and unsafe dress or apparel.

Mechanical safeguarding probably has been practiced in American industry longer than any other type of accident prevention work, one possible reason being that property loss was considered worth preventing long before safety efforts were directed to the protection of the workers. But safeguarding still goes on and its continued need in the cement and similar heavy industries is apparent from the fact that about 10 percent of the environmentally caused accidents in cement manufacture are still due to improper or inadequate mechanical guards. Hazardous arrangement is accountable for about half of the accidents due to faults in the environment, defective equipment and materials about 18 percent, unsafe dress or apparel about 20 percent and defects of illumination and ventilation together only about 2 percent.

Questions and Answers

1. What is the first step to be recommended in developing a good plan for inspecting the plant against accident hazards? A. Preparation of

a check list of suspected hazards, classified by type and department.

2. Can such a list be made complete on first attempt? A. No. It should be under constant suspicion of incompleteness and one should anticipate adding to it continually for many months and perhaps occasionally for several years.

3. Is such a list an infallible guide for inspectors? A. No, it is very valuable but must be supplemented with (a) reports of recent inspections, (b) suggestions contributed by workers and management, and (c) application of their own powers of observation and common sense.

4. Will one type of inspection generally do a complete inspection job? A. No. In most cases thorough examination of a plant for its physical hazards requires three types of inspection, as follows: (a) General or plantwide, which is most effective in revealing the many kinds of hazards which all or several of the plant departments have in common; (b) Departmental, directed particularly to the special hazards of an individual department; and (c) Specialized, as for example, electrical equipment hazards requiring the attention of a senior electrician or mechanical haz-

Samples taken from plant inspection check lists. Other list sheets cover housekeeping, high places, quarry face, outdoor clean-up, protective equipment, electrical equipment, illumination, ventilation, railroad, industrial vehicles, first-aid, and safety rules

SAFETY

ards requiring an inspector of master mechanic caliber.

5. How often need inspections be made? A. General inspections are usually made monthly, departmental inspections weekly or semi-weekly. Specialized inspections are made as often as required, depending entirely upon the nature of the equipment, material or premises inspected. Electrical equipment is usually inspected daily. Some mechanical equipment and tools are inspected and checked after each use.

6. By whom are general or plant-wide inspections most commonly made? A. By a committee of three competent men (of which the plant safety director is usually a member) rotated as practicable in order to train all of the available men in handling this service. Frequently the committee includes one junior member, entirely as a training measure.

7. Should men selected for this service be permitted to decline to serve? A. Ordinarily, no. Acceptance of an assignment as inspector should be accepted as an obligation and also as an unusual opportunity.

8. Should reports of general and departmental inspections be verbal, written or both? A. Verbal reports are not sufficient. They may be misunderstood and cannot always be referred to with any degree of accuracy later; a carefully written report should always be submitted and supplemented by such verbal explanation as may be necessary for complete understanding.

9. Do specialized examinations always require written reports? A. They require notations but not always written reports.

10. What are some of the pieces of apparatus frequently designated for specialized inspection? A. By the master mechanic or competent assistant: chain, chain hooks, cables, conveyors, elevators, ropes and belts. By the chief electrician or competent assistant: electrical equipment, control apparatus, lines. By the superintendent: structures.

Areas and Items Commonly Covered in General Inspections

(a) Quarry floors, ramps, faces, and surroundings; clay pits; mines; magazines; yards and other ground areas not occupied by buildings. Among the specific items included in the latter are sewers, gutters, and ditches; bridges; railroads and electrical transmission lines and overhead obstructions.



Portland Cement Association subcommittee on safety education considers means for stimulating interest in plant safety meetings

(b) Entrance appurtenances, including driveways, sidewalks, gates and fences.

(c) Buildings, including such specific items as floors, runways, ramps, tunnels, stairs, handrails, ladders, doors, windows, walls, and roof; illuminating and ventilating lines and control apparatus.

(d) Fixed equipment, including electric power installations and mechanical guards.

(e) Tools, hand and power driven. Includes rigging equipment and welding outfit.

(f) Materials: raw, semi-processed, finished; supplies, fuel, junk.

(g) Service facilities, including change houses, lockers, first-aid rooms and equipment; employees' personal property; fire fighting apparatus; bulletin boards and warning signs; personal protective equipment; apparel being worn by employees.

(h) Transportation equipment, including railroad locomotives and cars; tramways; locomotive and other cranes; electric and steam shovels; trucks; tractors; bulldozers; buses and passenger automobiles.

Check lists, shown in the samples, will be found valuable guides in developing good plant inspection practice.

New Hampshire Mica

THE MICA DEPOSITS of western New Hampshire have been examined by J. C. Olson, geologist of the Geological Survey, United States Department of the Interior, as a part of the Survey's investigation of domestic sources of strategic minerals. High-grade sheet mica is regarded as a strategic mineral because it is widely used in radios, spark plugs, airplane motors, and other electrical equipment and has been obtained in the past mainly

from foreign sources, principally India. The cheapness of labor at these foreign mines gives them a great advantage, for much hand labor is required in preparing mica for the market.

The sheet mica occurs in blocky crystals, called books, distributed in large pegmatite bodies. In the best mines the books are localized in zones or streaks. The limits of these zones cannot be predicted in advance of mining; reserves of individual deposits therefore cannot be estimated. The examination showed, however, that the region as a whole contains large reserves of sheet mica, much of it of potential strategic value.

Since 1803, when the first commercial mica mining in the United States was started at the Ruggles mine, in Grafton County, these New Hampshire deposits have yielded a substantial part of the domestic production. An average of more than 400,000 pounds of sheet and punch mica was produced annually from 1908 to 1939. But for the past 10 years production has been below this average because imported mica has competed in the domestic market. Olson's examination covered 139 mines—practically all in the region. He estimated that the western New Hampshire deposits could supply annually for several years about 500,000 pounds of sheet and punch mica, of which about one-fifth would be sheet mica, at a cost slightly higher than the average of the past.

Tests made by the National Bureau of Standards on samples of carefully selected sheet mica from New Hampshire indicate that it meets the exacting specifications established for mica used in some types of equipment. No estimate, however, can be made of the amount of such high-quality mica that might be produced.

DUST COLLECTION

Efficient Enclosures Solve Dust Problem

Lynn Sand and Stone Co., has developed a system of plywood enclosures for all the screens, crushers, and conveyors

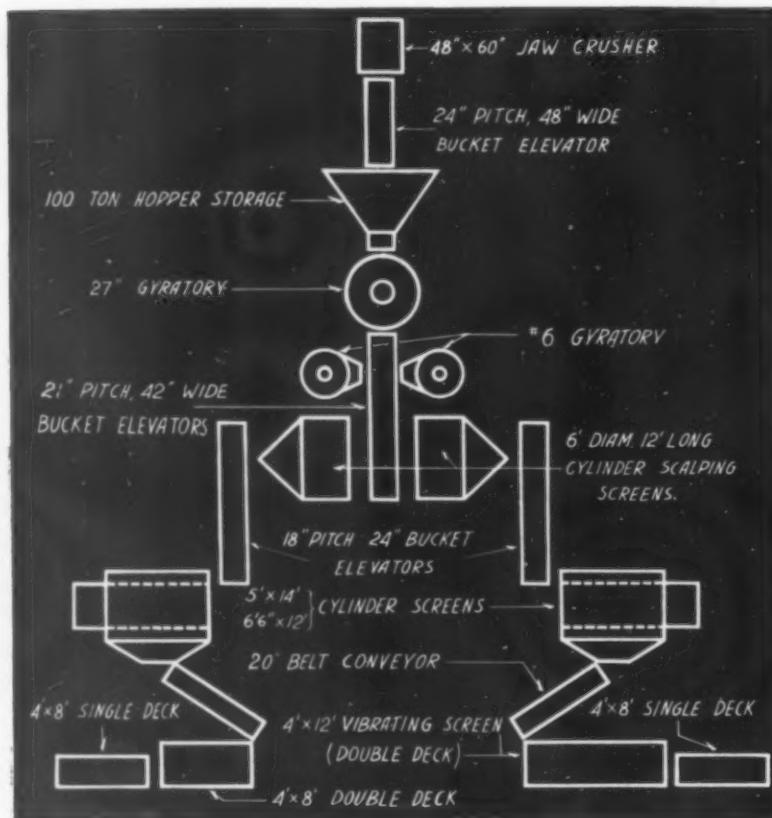
ONE OF THE BIG PROBLEMS in dust control, when applied to crushed stone operations, is the design and construction of adequate enclosures. Without provisions for confining dust at the more important sources, a dust collector has little chance to do a good job.

Enclosures installed in the crushed stone plant of Lynn Sand and Stone Co., Swampscott, Mass., are particularly efficient. In this plant, a way has been found to enclose equipment where others might say it could not

be done. Every individual enclosure was designed so that there would be no interference to operation and maintenance of the machinery.

Dust control was adopted principally as a measure for safety and to better working conditions in and around the plant. W. C. L. Hemeon, engineer for the Massachusetts Division of Occupational Hygiene, in co-operation with company officials, engineered and supervised the construction of the entire dust control system.

Flow sheet of crushed stone operations, showing the different applications of plywood dust preventative enclosures



W. C. L. Hemeon, who assisted in designing the dust enclosure system

The accompanying flowsheet of the plant and the information on air volumes at the various locations show how thoroughly the job was done.

Plant capacity is 250 tons per hour of a crushed granitic rock (Gabbro-Diorite). None of the stone is washed. After the second stage of crushing, the plant becomes a dual operation so that only part of the screening units are in operation during the winter months. Then stone from stockpiles is first put through a dryer.

Dust Collector Installations

For this reason, the plant has two Parsons bag-type dust collectors of different sizes. Both are needed when running full capacity. The small one is sufficient for winter screening.

Bin capacity is 3000 tons of finished product in concrete bins. To prevent the escape of any dust entering the bins, a complete floor was installed over them. Suction is applied at the discharges of the several crushers, but the bottoms of the crushers also were completely housed in to prevent dust not drawn out from escaping and to cause it to settle.

All the screen boxes are hoppered down to the bins to discharge below the bin "ceilings," and all the screens, both rotary and revolving, are totally enclosed. Drives for the various equipment are outside the enclosures, and doors are appropriately placed to allow workmen to enter each enclosure to service and repair the machinery. Elevators are enclosed, as illustrated.

(Continued on page 48)

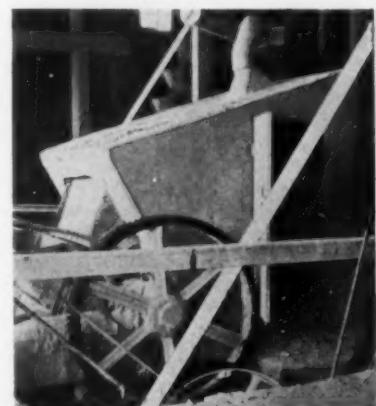
DUST COLLECTION



Bag-type dust collector installation adjacent to bins of crushed stone plant. Collectors are shaken down after every 2½ hr.

Location	Size of Piping (in inches)	Volume of Air (c.f.m.)
Discharge from 48- x 60-in. crusher into 48-in. bucket elevator	8	1490
Top of elevator at point of discharge	7	1170
Discharge from three gyratory crushers into 21-in. elevator	10½	2000
Top of 21-in. elevator at discharge into two revolving scalping screens	8	1380
Two rotary scalping screens and the discharge of oversize into the No. 6 crushers	East—7 West—7	1100 990
Discharge of fines from the scalping screens into two 18-in. elevators	East—8 West—8	1195 1470
Head of 18-in. elevator—discharge into two rotary sizing screens	East—7 West—7	1010 1100
Over the rotary screens near the point of discharge	7	790
Discharge from crushers through chute into 18-in. elevator	7 6 6	1130 610 865
Discharge from belt conveyor on to two successive vibrating screens	{ East—9 West—9 5 5	1410 1440 520 560
Total volume of air		20,230

Dust enclosures on vibrating screen installation. Note protection around chutes and doors for access into equipment



Enclosure at head end of 21-in. bucket elevator with exhaust duct. Note open door, normally closed



Discharge end of cone crusher completely enclosed to prevent escape of dust

Control and Collection of Industrial Dust

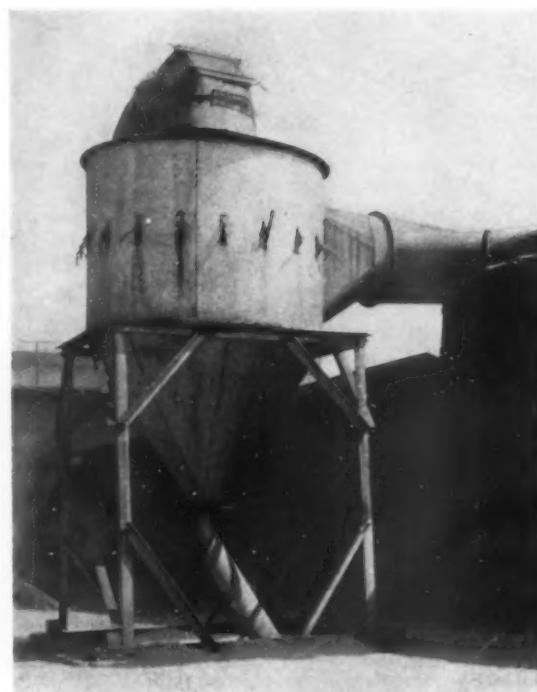
By E. D. POWERS*

PART 2—Low Efficiency Cyclones

HERE are probably as many collectors of this style in use as all others combined. Its efficiency, handling dust of 100 mesh and under, is seldom higher than 60 percent, but for heavy and large particle sizes, wood shavings, turnings, etc., it is very satisfactory. Units of this type are sometimes used in series, but the overall efficiency, power requirements and initial cost, usually do not justify that design as compared to a single pass high efficiency collector.

The cyclone design is based on the principle of the vortex. Dust laden gas enters tangentially near the top, being forced down in an ever decreasing spiral. The dust particles are precipitated to the periphery, the separating effect increasing as the diameter reduces. Clean gas forms a vortex, and travels up and out. The dust swirls down into a collection chamber and is released through the bottom of the cone, which must be sealed when the cyclone is in operation. Rotary valves and other types of gates can be used as air locks.

Fig. 9: Centrifugal trap equipped with adjustable skimmers

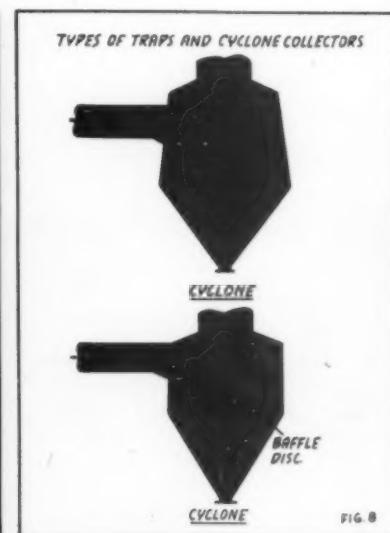
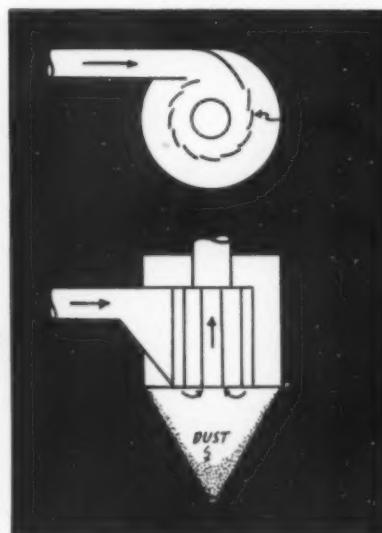
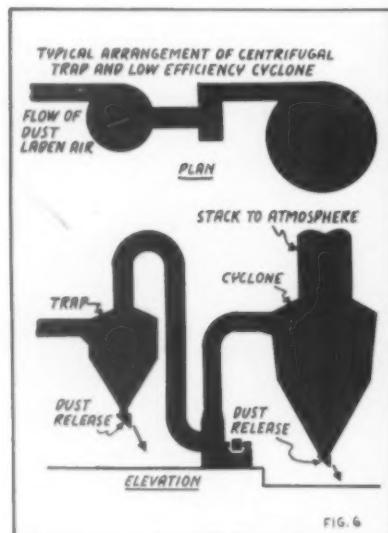


When used in series (Fig. 6) the first unit is called a trap, and its function is to separate out the large grains. In some designs (Fig. 7) adjustable blades are used, to skim off the heavy dust concentration which is carried to the outer periphery by

centrifugal forces. Fig. No. 9 is a photograph of a skimmer trap.

Many patented features have been incorporated in the design of cyclones, but the slight improved efficiency over

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Left to right: Fig. 6. Typical arrangement of centrifugal trap and low efficiency cyclone. Fig. 7. Centrifugal trap with dust skimmers. Fig. 8. Two types of centrifugal cyclone collectors. Baffle disc applied to collector, below, not considered efficient

DUST COLLECTION

the conventional type would not seem to justify the added cost. Fig. 8 shows two centrifugal cyclone collectors. There are a great number of designs, but generally speaking, there is not much difference in their efficiencies.

The baffle disc indicated in the lower cyclone (Fig. No. 8) is in our opinion bad and should be omitted.

Advantages of Low Efficiency Cyclones

1. The standard designs are not covered by patents, and can be built by anyone with consequent low initial cost.
2. Because of the low velocity, wear from abrasion is usually not great and light gauge metals can be used.

3. The resistance through the collector is low, usually below $1\frac{1}{2}$ in. S.P. and consequent power costs are much less than high velocity cyclones and cloth filters.

4. This is no doubt the most satisfactory equipment for handling wood shavings, turnings, chips, blocks and granules. It can also often be used to advantage for many dusts, particularly those of very high specific gravity and many over 100 mesh. Most industrial dusts, however, contain too great a percentage of fine particles to be satisfactorily handled in equipment of this type. There are times when it is desirable to make a rough classification of coarse and fine grains, in which case, this style cyclone can be used for the separation of the larger particles and the finer dust caught in filters or other high efficiency collectors.

Disadvantages of Low Efficiency Cyclones

1. If there is a silicosis hazard, this collector is not usually efficient enough to be satisfactory.
2. If recovered dust has a value, the

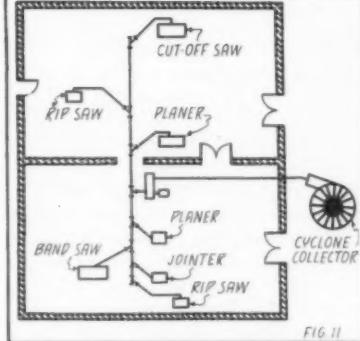


Fig. 11: Layout for dust collecting system in a wood working shop

increased cost of a more efficient type can often be justified.

There is usually a wide range in the sizes of the dust particles to be handled in any system and a few actual examples will probably best illustrate the limitations of this collector.

Fig. 10 is an illustration of a typical installation in a wood working shop for handling shavings, sawdust and chips. It is not recommended that the fan be placed ahead of the cyclone as was necessary in this case. It is safer and more satisfactory to have the fan handle clean air. The collection is very efficient showing no indication of dust loss at the cyclone dis-



Fig. 10: Cyclone collector connected to wood shaving system (Fig. 11)

charge. The layout as shown in Fig. No. 11, is very simple. The air velocity in the ducts is 3500 f.p.m. The total

Volume of gas.....	35,000 c.f.m.
Temperature of gas.....	194 deg. F.
Weight of dust per cu. ft.	54 lb.
Nature of dust.....	abrasive
Value of dust per ton.....	\$4.00
Total dust in gas to cyclone.....	8,870 lb. per day
Dust collected in cyclone.....	8,000 lb. per day
Efficiency of cyclone.....	91%
The sieve test of dust collected is as follows:	
Plus 10 mesh.....	0.40%
Plus 20 mesh.....	0.80%
Plus 40 mesh.....	4.0%
Plus 100 mesh.....	7.4%
Plus 200 mesh.....	18.2%
Minus 200 mesh.....	69.2%

air handled is 3530 c.f.m. and the power used 4.5 hp. The resistance across the cyclone is $1\frac{1}{4}$ in. S.P. Care must be taken in housing in the points of collection, sharp bends avoided and

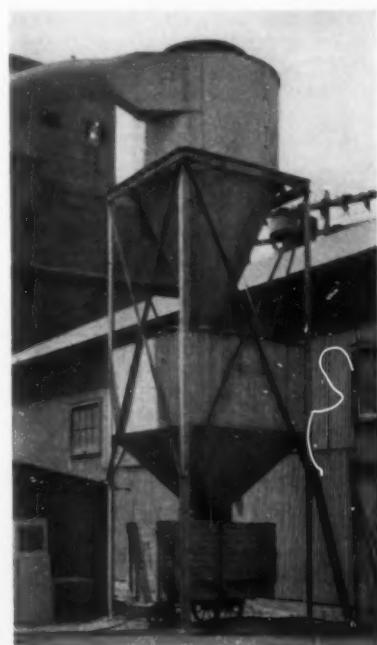


Fig. 12: Collecting coke dust with a cyclone collector

velocities calculated to carry the largest material to be handled.

A velocity of 3500 to 4000 f.p.m. (at 70 deg. F. air) will handle sawdust and heavy shavings from damp wood, whereas 4000 to 5000 is required for wood chips and waste from a wood working plant. Without question, this is the ideal equipment for this problem.

Figs. 12 and 13 illustrate a low resistance cyclone for separating dust from the gases leaving two 8- x 60-ft. rotary coke dryers. The conditions are shown in the opposite table.

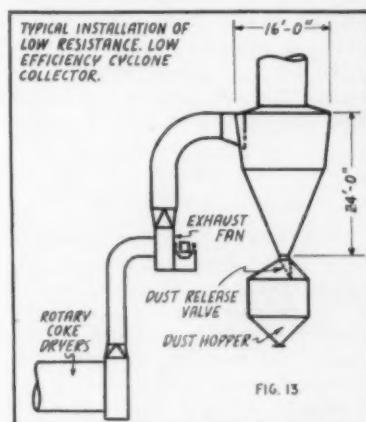


Fig. 13: Low resistance cyclone for separating dust from the gases leaving two rotary coke dryers

DUST COLLECTION

This is an unusually high collection efficiency. Collectors of this type, handling dust particles as shown, would ordinarily be expected to collect from 60 percent to 75 percent.

The sieve test would indicate that a higher efficiency type collector might be used; possibly high efficiency cyclones. Because of the abrasive nature of the dust, it would be advisable to make the lower section of high velocity cyclones of cast iron or abrasion resisting nickel chrome alloy steel.

Other types of collectors were considered but it was thought that they might be less satisfactory for the following reasons:

TYPE	OBJECTION
1. Cloth Filters— bag type	High temperature moisture in gas.
2. Cloth Filters— panel	Above reasons plus stickiness of dust.
3. Settling chambers	Low collection efficiency of this type dust.
4. Water spray	In this case, wet dust could not be reprocessed.
5. Fan centrifugals	High repair cost due to abrasive dust.
6. Electrostatic precipitators	Initial cost too high.
7. Baffle type	Space required. Stickiness of dust.

The above would seem to be the practical approach to the selection of the equipment most suitable for any problem. In some cases, all of the factors are not known and assumptions must be made to arrive at a decision.

The operation of the low velocity, low resistance cyclone as installed is very satisfactory for that type of equipment. The power requirements are low as the resistance across the collector is only $\frac{1}{2}$ in. S.P.

Of the 8870 lb. of dust per day entering the cyclone, 800 lb. are caught. The sieve test of the 870 lb. of dust which escapes, is as follows:

Plus 47 mesh.....	0.1%
Plus 100 mesh.....	0.2%
Plus 200 mesh.....	0.6%
Minus 200 mesh.....	99.1%

Tests were made to determine how much of the dust, lost through the system, could be collected in high efficiency cyclones. This was done by drawing a definite quantity of the exhaust gas from the cyclone stack through a small, high efficiency cyclone collector, and then through a cloth filter bag, thereby completing a 100 percent collection. Great care must be exercised in the test, as the dust burden is not uniformly distrib-

uted throughout the cross section of any pipe or stack. The details of this method are described in the section "Sampling and Testing."

The loss through the low efficiency cyclone was 870 lb. per day, while the test showed that had high efficiency collectors been used in this case the loss would have been 700 lb. per day, which difference would not have justified the extra initial investment or power costs.

Collection of the dust lost through a high efficiency cyclone would require that they be replaced by water sprays or electrostatic precipitators (cloth filters being impractical in this case) but the quantity of dust lost would not justify the expense, particularly as the particles sizes are so small and being vented to atmosphere at a reasonable height do not constitute a community nuisance problem.

The general design of this style collector is not covered by patents though many of the special features are protected by various companies. They can be built by any sheet metal or plate fabricating shop. There are, however, a great number of companies specializing in the manufacture of this equipment, and as prices are very competitive, it is generally more satisfactory to deal with them.

Efficient Enclosures Solve Dust Problem

(Continued from page 44)

and all chutes are enclosed. All enclosures are of plywood and those exposed to the weather are of "Weldwood," a waterproof plywood commonly used in the manufacture of boats. The preceding table describes the locations from which dust is withdrawn and lists the volumes of air actually carried through the pipelines:

Every $2\frac{1}{2}$ hr. the collectors are shaken down, and the dust is either loaded direct into covered trucks or transit mixers for sale as an asphalt filler, or it is dumped and wasted. Recovery is six to eight tons in eight hours' operation.

All the construction work was by company employees under the supervision of T. C. Cooke, president of the company, who is pioneering dust control in the crushed stone industry of Massachusetts. Other officers are W. D. Manchester, vice-president; C. H. Latham, vice-president; and George Place, secretary.

Dredging

(Continued from page 41)

hot air furnace for the main deck house. This was supplied by the Ray Oil Burner Co.

Each of the wings of the hull, on either side of the ladder well, is divided into three water-tight compartments, with access only by man-hole on the main deck. The main part of the hull has a water-tight collision bulk head nine feet from the stern plate. This collision compartment is subdivided into three sections. These are used as water tanks for trimming the dredge both fore and aft and cross-ships.

Hull and superstructure were welded throughout and strongly built. Plates below water level are of Bethlehem Steel Mayari R. low alloy steel. This was used more particularly for its corrosion resisting properties, although it has about 30 percent more strength than ordinary steel, since there are no facilities for hauling out the dredge. Operation is in a landlocked lake where there is no drydock or marine railway. Periodic scraping and painting can be effected by means of a floating caisson which can be placed over fractional sections of the hull to give access to the bottom and sides.

In the year and more that the dredge has been in commission, it has given a satisfactory account of itself, with only minor changes to facilitate fast operation and rapid repairs. New steel barges and two steel tugs were constructed during the preceding year, so that the entire floating equipment of this plant is now of modern well-built steel construction. This is as it should be since this plant has over 100,000,000 tons of raw material ahead of it, and it is the policy of the Warner Company to put this plant in the best possible condition for a long, useful life.

Highway Construction Priority Ratings

HIGHWAY CONTRACTORS needing road machinery and equipment must make individual application in the future on form PD-1a instead of extending preference ratings assigned to road projects, according to an amendment to order P-19-e issued by W.P.B. However, the ratings assigned to road projects may be extended to obtain repair parts and materials to be physically incorporated in the road to prevent stoppages.

Lime Experimentation

Article 3 covers the various factors essential for maximum kiln capacities

By VICTOR J. AZBE

DESIGN and installation of the automatic draw on the Beachville, Ont. kiln was started purely as an experiment, although an experiment on a grand scale, costing many thousands of dollars. The management was informed that this may, and again may not, work; that if it does not the money will be wasted, but if it does come up to expectations, then it will be well worth the investment.

It more than proved its worth. The kilns with automatic draws established new records of capacity and efficiency. Kilns that normally would be 50 to 60-ton kilns are now 80-ton kilns, and may soon be 100-ton kilns, the first gas-fired kilns of this capacity ever operated in this country, and in proportion to size are now the highest capacity kilns in the world.

It all comes from experimentation, systematic not haphazard trials. The pros and cons were studied and argued for a year before, the draws were designed in drawing and model form, they were adapted to the kiln, the kiln was adapted to the draws.

Results of this installation were presented in a paper before the National Lime Association 1941 meeting, but since then they were enhanced and now further changes have been made for the ultimate in results.

A kiln of 53 sq. ft. shaft area is not a very large kiln. There are many kilns of this size producing about 18 tons of lime while Beachville kilns, having such a shaft, produce in excess of 80 tons regularly. Although 2000 lb. per square foot of shaft area was considered very high and the practical maximum but a short time ago, the ratio of these kilns is over 50% more, or about 3200 lb. per sq. ft.

However, what is the limit? Tests on kilns proved that they make as much lime as they get gas and take as much gas as they have draft. Draft resistance through the lime and stone was evaluated, the power was measured, terminal temperatures were evaluated and mathematical factors were resorted to, from all of

which the conclusion was formed that if draft is raised from 5 to 8 in., if fan motor power is increased from 20 to the so far unheard of rate of 40 hp. per kiln, that capacity will be raised to 100 tons per kiln day or 3750 lb. per horizontal square foot of a 36 ft. high shaft.

Fig. 4 shows the relationship of draft intensity, fan power requirements, and kiln capacity. Forty horse power of fan power per kiln is high, that is true enough, but more than well worth it, as the higher the kiln capacity the lower is the plant investment cost, labor cost and fuel cost per ton of lime. Power cost increase is insignificant in comparison, up to this 100-ton point anyway, beyond this it is different; power rises so fast at 100 tons that we may be right in our assumption that a capacity of a hundred tons from such a kiln is the maximum, but what a glorious maximum.

It has been several years since the writer made the statement that

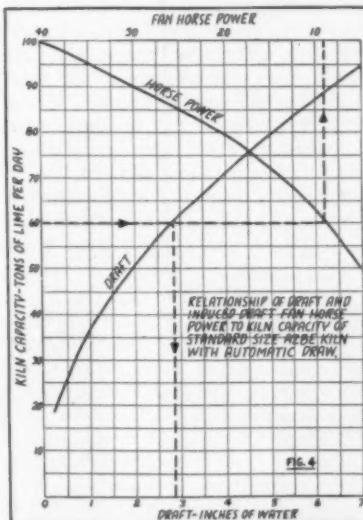


Fig. 4: Relationship of draft and induced draft fan horse power to kiln capacity of standard size Azbe kiln with automatic draw

LIME FORUM

Mr. Azbe, consulting engineer, is a contributing and consulting editor of ROCK PRODUCTS. He will be glad to receive inquiries from his readers, and will answer these direct or through the columns of this Forum.

everything being right, lime kiln waste gas temperatures will not increase with increase in capacity. The reason is that heat transfer varies as the 1.7 power of velocity of the gas, and that the temperature difference in the hot zone, where heat is with most difficulty transferred is raised somewhat. Beachville kilns prove this out—top temperatures are as low at 80 tons as they were at 50 tons, if anything possibly a little lower. It is this that, in part, will make 100 tons possible out of a 36-ft. high shaft; if this principle did not apply kilns would have to be impractically high for such production.

Patent Decision on Oyster-Shell Burning

The Supreme Court of the United States recently refused to review the decision of the Circuit Court of Appeals for the Fifth Circuit Court in the case of W. D. Haden Co. vs. Mathieson Alkali Works, Inc., which had been favorable to the Mathieson company. The W. D. Haden Co., Houston, Texas, well-known lime producer, asserted broad patent rights covering this shell burning process on the basis of U. S. Patent 1,896,403. Crushing of the shell before calcining is an essential part of the process covered by this patent, according to the determinations of the district and circuit court of appeals. It was contended by Mathieson company that it washes shells as dredged from the reefs and subjects them to no crushing treatment before calcining in rotary kilns of special design. According to the decision of the lower courts and approved by the Supreme Court, the Mathieson process does not violate the Haden patent.

UNITED STATES GYPSUM Co., Alabaster, Mich., plant had a fire of unknown origin recently that destroyed the building which housed the offices, general store and postoffice.

GYPSUM

A Strong Plaster For Paperless Wallboard

New process of gypsum manufacture involves "cooking" raw gypsum in Epsom salts solution and then filtering and washing the plaster

By W. A. CUNNINGHAM*

SINCE THE RATE of heat transfer from gas to solid is notoriously low, either long-time heating or relatively high gas temperatures, or both, must be utilized. In the latter case the resultant plaster, though chiefly hemi-hydrate, contains some anhydrite caused by local overheating and some unchanged gypsum.

The change from gypsum to plaster apparently involves nothing more than the reduction of the water of crystallization from 2 mol of H_2O per mol of $CaSO_4$ to $\frac{1}{2}$ mol H_2O per mol $CaSO_4$. However, a study of the solubility of $CaSO_4$ in water (Fig. 1) shows that anhydrite is the stable phase at all temperatures above 104 deg. F. and that gypsum is the stable phase below that temperature. Partridge and White[†] point out that the hemi-hydrate forms a very persistent meta-stable phase at temperatures ranging from 212 deg. F. to about 320

deg. F. when in the presence of water under pressure. Since plaster of Paris normally is made by heating dry gypsum, the meta-stable hemi-hydrate is also formed in the absence of the liquid phase.

Plaster will set at all temperatures below 212 deg. F., though the rate of setting is quite slow at the higher temperatures. The setting involves the combination of the hemi-hydrate with water to form gypsum, even though the gypsum is the ultimately stable phase only below 104 deg. F. Hence, at temperatures between 104 and 212 deg. F., plaster sets by being changed from one meta-stable phase, hemi-hydrate, to another more persistent meta-stable phase, gypsum. The persistence of this meta-stable phase is further emphasized by the fact that set masses of gypsum plaster show little or no tendency to change over to anhydrite, the ultimately stable phase. If this were not true, the use of plaster of Paris as a structural material would be limited to locations in which the temperature remained below about 100 deg. F.

Another evidence of the persistency

of the gypsum phase is the fact that no successful method has ever been developed whereby plaster could be made directly from anhydrite. On the basis of the water of crystallization contents of the three materials, it should be a very simple matter to add $\frac{1}{2}$ mol of water to 1 mol of anhydrite to produce a mol of plaster of Paris. Instead, the only commercially successful utilization of anhydrite in the manufacture of plaster of Paris has involved the initial production of gypsum and the subsequent transformation of the latter to the hemi-hydrate. The phase relationships as expressed by the solubility data show why this must be, since gypsum is a persistent meta-stable phase between the anhydrite and the hemi-hydrate.

The calcium sulfate hemi-hydrate produced by calcination does not exist in its own specific crystal form, but rather as a pseudo-morph after the gypsum from which it is derived. Consequently, the plaster so produced is in the form of irregular fragments which result from the crushing and grinding of the original gypsum. (Plate 1.)

[†]Randel, W. S. and Dailey, M. C., U. S. Patent 1,901,061 (1933).

[‡]Partridge, E. P. and White, A. H., J. Am. Chem. Soc. 51, 360 (1929).

*Department of Chemical Engineering, University of Texas, Austin, Tex.

Plate 2. Calcium sulfate hemi-hydrate crystals produced by heating gypsum in calcium chloride solution (185x)

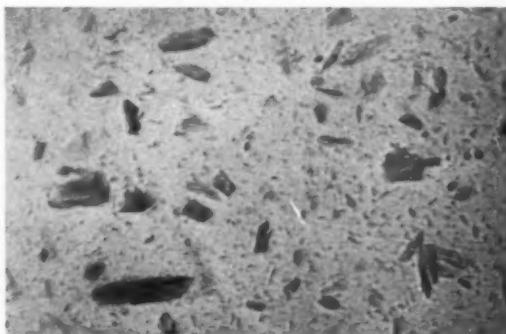
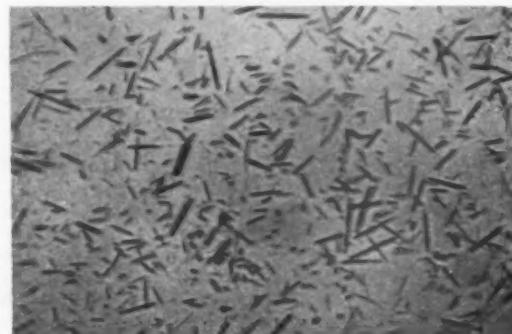


Plate 1. Microphotograph of calcined plaster (185x) showing irregular fragments which result from the crushing and grinding of the original gypsum

Plate 3. Calcium sulfate hemi-hydrate crystals produced by heating gypsum in sodium chloride solution (185x)



GYPSUM

It has been known for many years that gypsum could be converted to the hemi-hydrate by heating in various aqueous solutions or even in water under pressure. Many of the products thus obtained would not set, hence, since anhydrite is the stable phase, it is not impossible that some were not hemi-hydrates at all, but were mixtures of anhydrite gypsum.

Hemi-hydrate has a water of crystallization content of 6.2 percent. It is evident also that a properly proportioned mixture of anhydrite and gypsum would show a water content of 6.2 percent, but certainly it would not set. Thus, in any sample having such a water content, there may be present either a non-setting, or slow setting, hemi-hydrate, or a mixture of anhydrite and gypsum. Since the crystals are all very small and since the hemi-hydrates have a very strong tendency to assume the pseudo-morphic forms of the parent material, even microscopic examinations are apt to be misleading. Neither the crystal form nor the percent of water can serve as a criterion of setting; the only sure method is to make a definite trial to see whether or not the mate-

*Schoch, E. P. and Cunningham, W. A., Trans. Am. Inst. of Chem. Eng. 37, 1, (1940).

^tSchoch, E. P., U. S. Patent 1,989,712, (1935).

TABLE 1.—PROPERTIES OF CALCIUM SULPHATE HEMI-HYDRATE PRODUCTS MADE BY HEATING GYPSUM IN AQUEOUS SOLUTIONS

Nature of Solution	Description of Hemi-hydrate crystals	Water Carrying Capacity c.c. per 100 gms.	Tensile Strength lb./sq. in.	Plate No.
Sodium Chloride	Long, needle-like, bulky.	over 100	less than 100	2
Calcium Chloride	Long rods, bulky.	about 100	450	3
Nitric Acid	Very short, stumpy rods.	60	300	4
Magnesium Sulfate	Short, stocky rods.	less than 50	over 600	5

rial will set. Plaster of Paris is not merely calcium sulfate hemi-hydrate; it is a calcium sulfate hemi-hydrate which, when tempered with water, will have desired working properties.

Hence, despite the descriptions of laboratory processes for the production of hemi-hydrate, and the descriptions of the microscopical and chemical examinations of the crystals, the products obtained cannot be assumed to be plaster.

Schoch and Cunningham* showed that the hemi-hydrate products resulting from heating gypsum in aqueous solutions have crystal forms which are characteristic of each particular solution. (Plates 2, 3, 4, 5.) The properties of these different materials are summarized in Table 1.

The hemi-hydrates made in the

calcium chloride and sodium chloride solutions have such poor working qualities that they cannot be classified as "plasters." The mechanical difficulties of handling the hot nitric acid preclude its being used as a commercial basis. On the other hand, the working qualities of the hemi-hydrate made in magnesium sulfate solution are very good and it is the use of this solution which forms the basis of the Schoch process of plaster manufacture.^t

Briefly, the Schoch process consists of heating minus 30-mesh gypsum in 30 to 35 percent magnesium sulfate solution at a temperature of 265 deg. F. for about 45 minutes, filtering out the resultant plaster and washing it free of adhering solution, and drying the wet plaster. Since the unretarded wet plaster will set at all temperatures below the hemi-hydrate-anhydrite conversion point (about 210 deg. F.), the temperature of the wet or damp

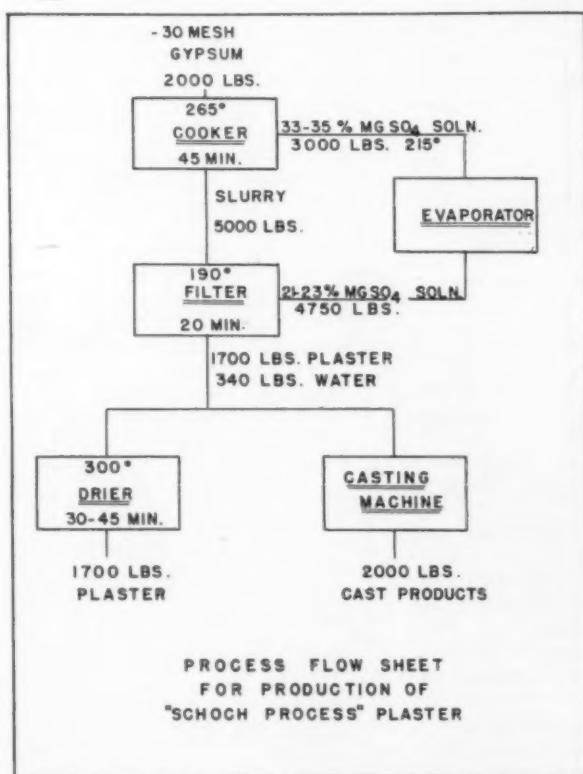
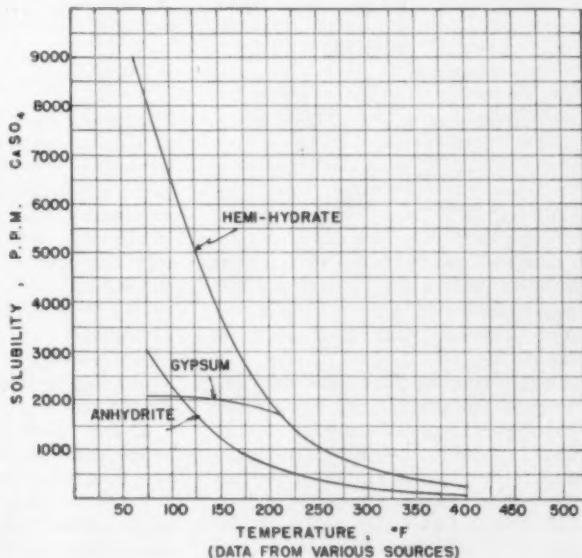


Fig. 2. left: Flow sheet showing the steps in the production of "Schoch Process" plaster

Fig. 1: Graph indicating solubility of CaSO_4 in water, showing that the anhydrite is the stable phase at all temperatures above 104 deg. F and that gypsum is the phase below that temperature



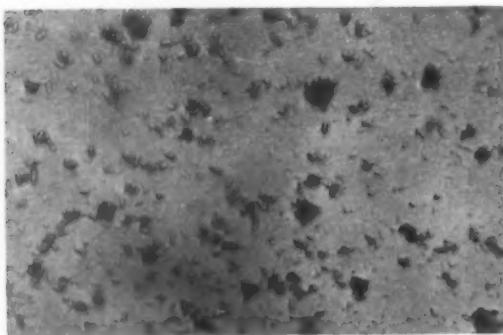


Plate 4. Calcium sulfate hemi-hydrate crystals produced by heating gypsum in nitric acid (185x)

mass must not be permitted to fall below 185 deg. F., at which temperatures the rate of hydration of the hemi-hydrate is quite slow. A process and materials flow sheet is shown in Fig. 2.

The plaster thus produced contains no anhydrite and no unchanged gypsum but consists of uniformly shaped, rod-like crystals of hemi-hydrate. (See Plate 5.)

Properties of Schoch Plaster

One striking characteristic of Schoch process plaster is its fineness. Though the raw gypsum used need be ground no finer than minus 30-mesh, over 80 percent of the finished dry plaster will pass a 200-mesh screen without any grinding. Typical screen analysis of both raw gypsum and unground plaster are given in Table 2.

TABLE 2.—AVERAGE SCREEN ANALYSIS OF RAW GYPSUM AND UNGROUND PLASTER

	Percent Original Gypsum	Percent Unground Plaster
Pass 30-mesh, on 40-mesh..	19	..
Pass 40-mesh, on 80-mesh..	14	1
Pass 80-mesh, on 100-mesh..	16	2
Pass 100-mesh, on 200-mesh..	28	15
Pass 200-mesh..	28	82

Despite its fineness, the plaster must be given a short grind in a ball mill or tube mill to give it the requisite plasticity and sand-carrying capacity.

The water carrying capacity (frequently erroneously referred to as the "normal consistency") averages about 45 c.c. of water per 100 grams; ball-milling to improve plasticity reduces the water carrying capacity to between 33 and 38 c.c. of water per 100 grams.

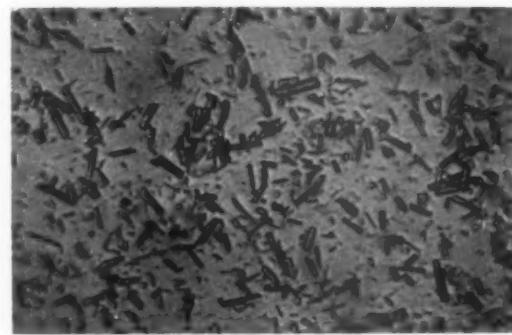


Plate 5. Calcium sulfate hemi-hydrate crystals produced by heating gypsum in magnesium sulfate solution (185x)

The normal setting time of 10 to 15 minutes is reduced to from 5 to 10 minutes by the grinding, but it can be controlled as desired by the addition of accelerators or retarders.

In Table 3 is shown a comparison of the strength of ordinary calcined plasters, neat cement and Schoch process plaster.

Laboratory tests have shown that the tensile and compressive strength can be increased to 950 and 6250 lb. per sq. in., respectively, by moderate ball mill grinding.

A small commercial plant having a capacity of one ton of high strength plaster per hour has been designed on the basis of the data obtained from extensive pilot plant operations. A materials flow sheet for the plant is shown in Fig. 2. The cost of the complete plant will be approximately \$48,000 and it will have an estimated operating cost as follows:

1. 29 tons gypsum at \$1.25.....	36.25
2. Fuel, gas: 88 M at \$0.10.....	8.80
3. Power, 450 KWH at \$0.02.....	9.00
4. Labor and supervision.....	25.00
5. Maintenance and miscellaneous supplies.....	25.00
6. Amortization (5 years of 250 days).....	38.40
7. Taxes, insurance, etc. (5% of investment).....	19.20
Total.....	821.65
Cost per ton of plaster.....	8.82

This is well above the cost of production of ordinary calcined plaster, but it can be reduced quite materially by larger scale operation.

The process has three distinct advantages over the standard calcining procedure—

1. The product is much harder and stronger.
2. The costs of grinding both gypsum and plaster are either eliminated or reduced to a minimum.
3. The processing time is reduced to less than two hours from raw gypsum to finished plaster.

Since the Schoch process as described above produces plaster by a wet method, greater economy is at-

tained by forming the damp plaster coming from the filter directly into tile, insulating blocks and other structural units without the intermediate production of dry plaster. In the ordinary manufacturing process the production of such units must necessarily be an added operation after the dry plaster is obtained. In the Schoch process, the damp plaster is not dried, but is cast directly into the structural unit of the desired shape and allowed to set. This alternative procedure is indicated in the flowsheet.

By the admixture of fibrous materials, such as sugar cane bagasse, a strong, shock-resistant "gypsum lumber" is produced. The incorporation of the fiber with the high strength plaster—a weaker plaster cannot be used satisfactorily—produces a smooth-surfaced board devoid of paper backing. The resultant board is so resilient that a nail can be driven into it without the formation of even incipient cracks. The surface of the board which sets in contact with the mold is hard and smooth, while the reverse side, though its surface is plain, is filled with irregular holes which make it a good plaster base. The board can be nailed, sawed, planed, and otherwise worked like

TABLE 3.—TENSILE AND COMPRESSIVE STRENGTHS OF SCHOCH PROCESS PLASTER

Material	Tensile Strength* lb. per sq. in.	Compressive Strength* lb. per sq. in.
Commercial wall plaster.....	175	1350
Commercial molding plaster.....	473	2765
Dental plaster.....	444	2735
Schoch process plaster.....	490	4610
Portland cement.....	650	4800

*All tests made according to A. S. T. M. specifications for 7-day strengths.

GYPSUM

wood, and, since it contains no lime, can be painted or tinted as desired without fear of "burning" the paint.

The board has been made experimentally in thicknesses ranging from $\frac{1}{4}$ in. to 4 in. depending on the use for which it is intended. For most purposes, a thickness of $\frac{1}{2}$ in. is best suited. The amount of fiber used can also be varied from 5 to 15 percent by weight of the plaster used. A very light, porous insulating board or block is produced when the larger amounts of fiber are used. The "standard" 10 percent fiber board whose tensile and compressive strengths and other properties have been described below is made by mixing the plaster and the fiber and allowing the mass to set without the application of pressure. On the other hand, an extremely hard, dense, impervious board can be made by mixing the fiber and plaster with a minimum amount of water and allowing the mass to set under pressures ranging from 250 to 1000 lb. per sq. in.

Because of the resiliency or "stretch" of the fibered product when under tension, the exact tensile strength is rather difficult to determine. When the tensile strength briquettes are broken in a standard testing machine, they exhibit an "initial yield point"—i.e., the hair-line cracks first appear—at a tension of from 175 to 225 lb. per sq. in., but a tension of from 325 to 350 lb. per sq. in. is required for rupture. At the point of rupture the break is not sharp and distinct as is the case with plaster or cement briquettes, but is more nearly a tear such as is noticed when wood is broken by the application of a tensile stress. The following tensile strengths are typical:

Test No.	Stress at		Stress at Rupture Point lb./sq. in.
	Initial Yield Point lb./sq. in.	Rupture Point lb./sq. in.	
1	175	350	
2	225	350	
3	180	330	
4	190	330	
Average	192.5	340	

The material on which the above tests were made contained 10 lb. of fiber per 100 lb. of plaster.

Compressive strength tests on 2-in. cubes containing fiber in the amounts of 7 and 10 percent of the weight of the plaster yield the following results:

COMPRESSIVE STRENGTHS

Test No.	lb./sq. in.	
	7 percent Fiber	10 percent Fiber
1	1100	1000
2	950	1025
3	1125	1100
4	1045	1025
Average	1045	1038

The behavior of the test cubes during compression and after "failure" furnishes an excellent indication of the ability of the material to stand up under extreme conditions. When the cubes are first put under pressure the unit stress rises to about 500 lb. per sq. in. At that point the cubes begin to absorb the stress by flattening very slightly, but to such an extent that the unit pressure exerted by the machine is not increased to any material extent. Finally, when the cube shortens about $\frac{1}{16}$ in., the unit pressure mounts normally to the point of failure. The point of "failure" is not marked by any great visible breakdown or spalling of the cube but merely by a decrease in the unit pressure. When the pressure is released the cube expands to within less than $\frac{1}{64}$ in. of its original size.

The fibered material bonds well to reinforcing steel. A 2- x 6-in. beam containing two $\frac{3}{8}$ -in. deformed steel bars, one in the tension and one in the compression section, showed "deformation under load" characteristics similar to wood. However, when the beam finally failed it did so with the appearance of the 45 deg. breaks characteristic of reinforced-concrete beams.

Summary

The manufacturing process consists of the following operations:

1. "Cooking" the raw gypsum in Epsom Salts solution to convert it to plaster.
2. Filtering and washing the plaster free of adhering solution.
3. Mixing the damp filter cake and bagasse fiber and casting it into the desired forms or molds.
4. Drying the resultant cast products after they have set.

The first two operations have been described in the foregoing part of this paper.

The mixing of the damp plaster and bagasse and casting into molds of the desired shape depends on the type of products which are to be made. Pug-mill type mixers have proven very satisfactory in pilot plant work, but any type of mixer in which the rabble arms do not tend to drag the fiber out of the mix can be used. Since the filter cake itself is hot, there is no need for the addition of retarders to control the setting time. Indeed, in some cases, the use of accelerating agents has proven advantageous.

The drying of the structure board has presented no particular problem. Since there is no paper on the out-

side, all slippage difficulties are eliminated. Boards of less than 1 in. in thickness can be dried within two hours at drier temperatures ranging from 200 to 250 deg. F., or, at a much slower rate at normal atmospheric conditions. Close humidity control is not necessary. The board shows no tendency to warp when dried under either of the two extreme conditions noted above.

The $\frac{1}{2}$ -in. structure board containing approximately 10 percent bagasse fiber by weight weighs approximately 2600 lb. per 1000 sq. ft. This weight probably can be decreased by the incorporation of voids within the mass, but the strength will also be decreased.

Though no commercial plant is yet in operation, estimates indicate that a plant having a capacity of 50 tons of board per 24 hour day can produce the board at a cost of about \$11.50 per 1000 sq. ft. This includes all fixed and operating costs, raw gypsum at \$2.00 per ton and bagasse at \$10.00 per ton, but does not include administration and sales costs.

The process of board manufacture is covered by a United States patent due to issue early in 1942.

Form Export Association

UNITED STATES INSULATION BOARD EXPORT ASSOCIATION has filed papers under the Export Trade Act with the Federal Trade Commission, for exporting insulation board, and will maintain an office at 55 W. 42d St., New York, N. Y.

Officers are B. G. Dahlberg, president and director; J. A. Sampson, secretary-treasurer; J. C. Best, C. H. Nance and Frank H. West, directors. Member companies are The Celotex Corp., Chicago, Ill.; Hawaiian Cane Products, Ltd., Honolulu, Hawaii; The Insulite Co., Minneapolis, Minn.; and National Gypsum Co., Buffalo, N. Y.

The Export Trade Act provides that nothing contained in the Sherman Act shall be construed as declaring to be illegal a combination or "association" entered into for the sole purpose of engaging in export trade and actually engaged solely in such export trade, provided there be no restraint of trade within the United States, or restraint of the export trade of any domestic competitor; and with the further prohibition of any agreement, understanding, conspiracy or act which shall artificially or intentionally enhance or depress prices within the United States, substantially lessen competition or otherwise restrain trade therein.

Effect of Admixtures On Portland Cement

Article 1. Studies of aluminum salts admixtures

By CHAS. H. JUMPER* and GEORGE KALOUSEK*

WHEN CEMENT AND WATER are mixed together, chemical reactions with accompanying changes begin immediately. The thermal effects may be followed qualitatively during these reactions by measuring the temperature of the cement pastes under specified conditions. As shown previously at the National Bureau of Standards (1),¹ a wide variation exists among cements, when mixed with water, in the rates and extent of temperature changes over a period of 24 hours. Such differences are not confined to finished portland cements, but can be induced

in varying degrees in the same clinker by the addition of materials other than gypsum.

The data in this paper and the brief remarks concerning them are presented largely because they are among the very few which have been obtained showing the temperatures of cement-water mixtures during the first 24 hours after mixing. They also show how numerous soluble salts affect both the rates of temperature rise and the maximum temperature attained. No conclusions are drawn leading to a basic understanding of the cement-water reaction or how it is affected by the presence of the salts. Although the data are rather

● The effects on changes of temperature with time and on time of set of five groups of salts and compounds added to mixtures of cement clinker in water were investigated. Aluminum, alkali, and calcium salts, a group of miscellaneous inorganic compounds, and a group of organic compounds were added in varying amounts to three cement clinkers and the changes in temperature effects and time of set are compared with those of untreated clinker-water mixes. A group containing gypsum plus other admixtures is included.

voluminous they are not of such a character as to permit of doing this. It is believed, however, that they show that knowing the thermal effects during setting and hardening will mate-

*National Bureau of Standards.

¹ The numbers in parenthesis refer to literature citations at the end of this paper.

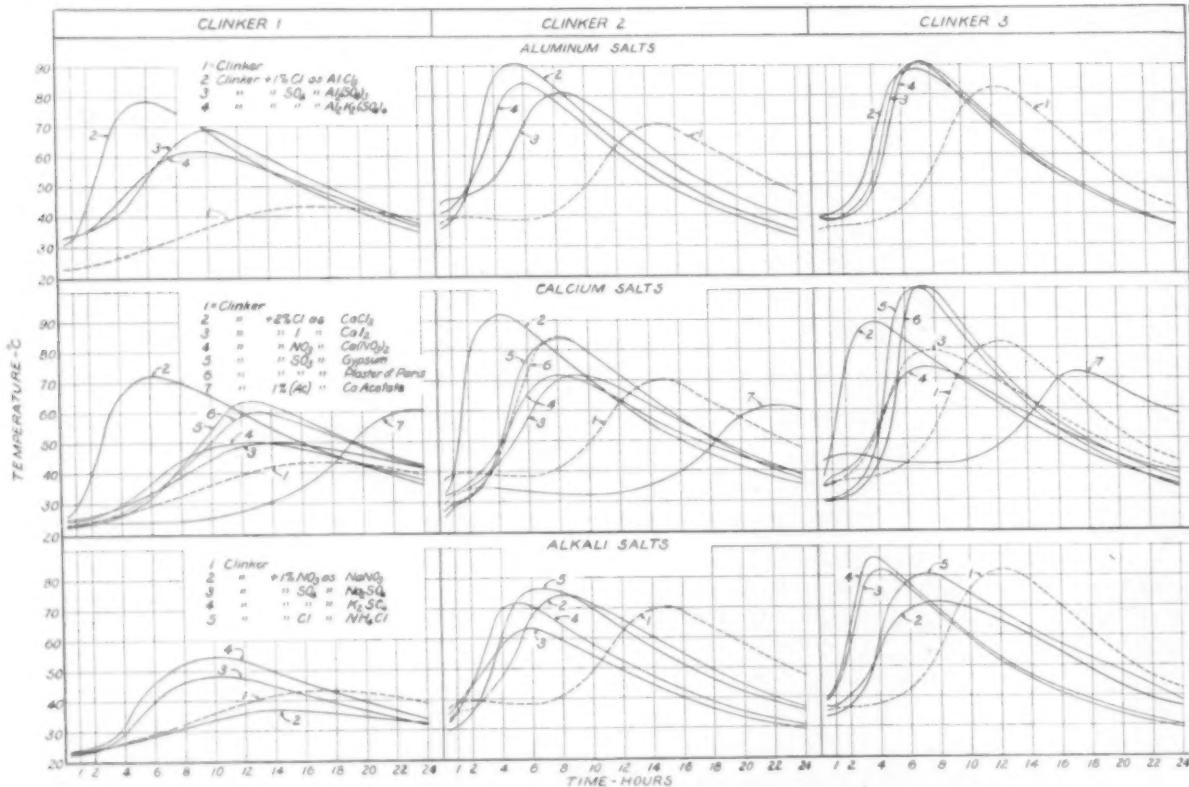


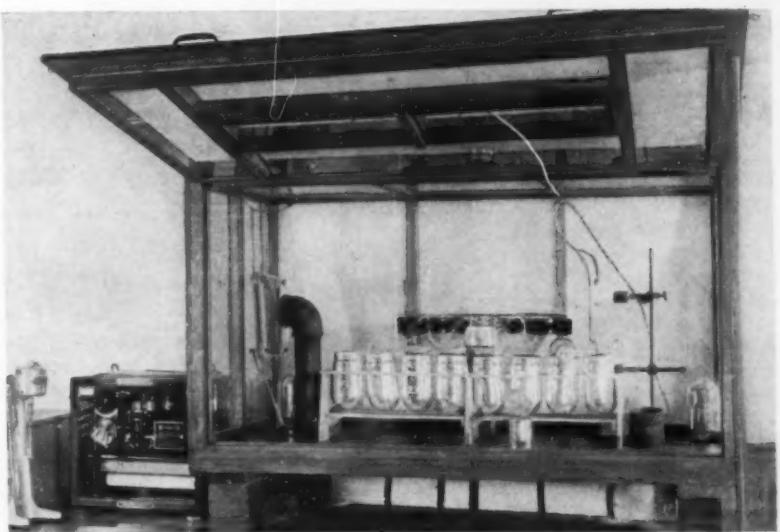
Fig. 2: Time-temperature curves of cement clinker pastes containing aluminum, calcium and alkali salts

CHEMIST'S CORNER

TABLE 2.—TEMPERATURE EFFECTS AND TIME OF SET OF CLINKERS WITH ADDITION PRODUCTS.

Clinker 1.										Clinker 2.										Clinker 3.									
Admixture	Percent water equivalent to 1 hr. at 25°C.	Temp. rise at 25°C.	Max. temp. rise at 1 hr. with time change in hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Set time hr.	Set time hr.	Initial final hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Max. temp. rise at 1 hr. in hr.	Time to max. temp. rise at 1 hr.	Max. temp. rise at 1 hr. in hr.										
Al ₂ Cl ₃ ·6H ₂ O	1.25%	1.25	2	9	25	17	7	11	0.4	1.6	6	11	50	15	6	10	fair	16	11	6	6	2.4-0.4	1.6-0.4	1.6-0.4	1.6-0.4	1.6-0.4			
Al ₂ (SO ₄) ₃ ·18H ₂ O	1.25%	1.25	3	12	4	21	8	10	0.4	2.0	9	9	56	12	0.4	10	fair	18	5	6	6	2.4-0.4	1.6-0.4	1.6-0.4	1.6-0.4	1.6-0.4			
Al ₂ (SO ₄) ₃ ·2H ₂ O	1.25%	1.25	3	12	4	21	8	10	0.4	2.0	11	11	57	10	0.4	10	fair	18	5	6	6	2.4-0.4	1.6-0.4	1.6-0.4	1.6-0.4	1.6-0.4			
Al ₂ (SO ₄) ₃ ·2H ₂ O	1.25%	1.25	3	12	4	21	8	10	0.4	2.0	11	11	57	10	0.4	10	fair	18	5	6	6	2.4-0.4	1.6-0.4	1.6-0.4	1.6-0.4	1.6-0.4			

Fig. 1: Thermostat, potentiometer recorder, stirrer and Thermos bottle assembly used in obtaining time-temperature data of cement clinker pastes



rially assist in finally elucidating the setting and hardening phenomena.

Three portland cement clinkers, one a high-early and two standard, of different compound compositions, have been used in this study. In Table 1 are given the chemical analyses and calculated compound compositions of the three clinkers (2).

The temperature data were obtained on cement-clinker pastes, with and without admixtures. A mixture of 200 grams of cement clinker and 67.5 grams of water was placed in a small tinned can and stirred for one minute with a mechanical mixer. The can containing the paste was then sealed in a cork-stoppered pint thermos jar and placed in a thermostat maintained at 20.5 ± 0.2 deg. C. A potentiometer recorder in conjunction

with thermocouples inserted in the paste was used to record the temperature of the paste during the test. The apparatus is shown in Fig. 1.

In all cases there was an initial rise in temperature following the addition of water to the clinkers and cements with and without the presence of the admixture. This was followed by a slower rate of temperature rise, but sooner or later the rate again increased for a time. Subsequently this rapid temperature rise subsided until a maximum temperature was attained. This in turn was followed by a decrease in temperature when the heat leakage of the flask exceeded that of the evolution of heat from the reaction mixture. In a few instances there were two periods at which rapid evolutions of heat resulted in two maxima. The temperature changes are illustrated in Fig. 2.

But, inasmuch as Fig. 2 curves pertain to but a relatively small proportion of the data, Table 2 has been constructed to contain the salient factors. The average of duplicate tests are reported in the two figures and the table. Thus, for comparative purposes this table includes: (1) an arbitrarily chosen temperature rise at 1 hour, (2) the maximum change of temperature with time, (3) the time in hours at which the maximum change of temperature with time occurs, (4) the maximum temperature rise, and (5) the time in hours required to attain the maximum temperature rise. In Table 2 are also given the name or formula of the

(Continued on page 57)

TABLE 1. CHEMICAL ANALYSIS AND CALCULATED COMPOUND COMPOSITIONS OF THE CLINKERS

Clinker	No. 1	No. 2	No. 3
SiO ₂	20.5	21.8	19.5
Al ₂ O ₃	6.8	6.7	7.0
Fe ₂ O ₃	3.5	2.2	2.5
CaO	63.9	64.4	66.2
MgO	2.1	1.7	3.3
SO ₃	0.1	0.4	0.6
Ig. Loss	2.5	1.4	0.5
Na ₂ O	0.11	*0.19	0.16
K ₂ O	0.70	*0.19	0.15
Insol.	0.3	0.4	0.4
Free CaO	1.9	2.6	3.1
CaS	45	36	56
CaS	25	35	14
CaA	12	14	14
CaAF	11	7	8

*Alkali determinations made on a clinker of the same brand as No. 2.

Practical Operation Conveyor Belts

PART 2—Suggestions for the elimination of unusual wear due to negligence or avoidable accidents

By MELVIN C. DOW and HARVEY A. HARNDEN

Now let us consider some other items affecting belt costs, items which we might classify as extraordinary wear, not inherent in the conveyor itself and over which the operator has some control. Most of these are due to negligence or accidents which are avoidable. Such accidents as burns and rips are avoidable by proper care in protecting the belt during construction or periods of alterations near the conveyor, by care in inspection during freezing weather before the conveyor is started, during operation by keeping the chutes clear at loading and discharge points, and in general by just good house-keeping.

Skirt boards should never be allowed to wear directly on the belt nor to be so located as to permit material to be wedged between them and the belt. Chutes may become worn and battered with use until the loading conditions become much more severe than necessary. When this occurs they should be repaired or replaced promptly. Or a condition may exist in the original chute installation which is causing excess wear. By close observation an easy remedy may be found for a condition

which is neglected because of its familiarity. Wipers and brushes must be kept clean to operate efficiently. This may require daily inspection and cleaning, or under severe conditions even more frequently.

Proper Belt Alignment

The proper training or alignment of a belt is a very important factor in the cost of operation of a conveyor. If a belt runs off line edge wear can be expected with the eventual loss of rubber protection at the edge so that moisture gets into the carcass causing deterioration and separation of the plies. As a result the belt has an early failure.

A belt should always be trained by the adjustment of idlers. In general the procedure is to square all idlers and pulleys with the center line of the belt. The cut ends of the belt should be square with the center line of the belt which is not necessarily the same as square with the edges, especially in used belts. Troughing idlers should be slightly tilted in the direction of travel. Chutes should be adjusted to load symmetrically. If it is then found that the belt has a tendency to run

off line a few idlers behind the point where the belt starts off should be turned to steer the belt toward the center. It is important to make this adjustment over several idlers instead of trying to do it with only one. A tail pulley should never be run on a slight skew in an attempt to train a belt. Ordinary guide idlers should be used only as a guard to prevent edge damage to a belt. If they are found to be constantly wearing against the belt and if the usual training methods fail to secure results, the so-called self-training idlers are a solution.

In an emergency a belt is sometimes unloaded by a scraper or plow, or an idler is tipped until the material spills off the side of the belt. Such an arrangement greatly shortens the life of a belt.

Preventing Belt Slippage

A belt which has been slipping on the drive pulley and therefore is tightened either by screw take-ups or the loading of gravity take-ups beyond the design load will show a higher cost. This is not realized by some operators as the belt continues to function with no apparent signs of



Extensive conveyor system at a large southern crushed stone plant. To the left is the scalping screen and reduction crusher unit; in the center, wet screening and bins; and to the right, dry screening and storage

CONVEYORS

failure. Nevertheless it is stressed beyond the design tension and the carcass will deteriorate gradually until weak points are developed. Such a situation requires some study. A remedy may be the lagging or re-lagging of the drive pulley, it may be necessary to install a larger drive pulley, a tandem drive, or replace the belt with one of sufficient strength for the additional tension. The original belt in this case of course may be used elsewhere.

The proper storage of new belts is important. When a belt shows signs of failure and a replacement belt is ordered, it is often found to be some time before it is necessary to put it into service. During this time the belt should be stored out of the weather and sun, and supported off the floor. It should be stored in a place which is free from dampness, oil or fumes which attack it. In storing a large belt its fire hazard should not be overlooked, and if necessary the fire insurance adjusted for its value.

When Is Belt Worn Out?

The operator must decide when a belt is worn out, that is, just when it must be removed and replaced. This seems to be no problem at all in the minds of individual operators. They know very definitely when that time is. If you ask one, "When is a belt worn out?", the answer is invariably, "When we take them off they are worn out, there is no question about that".

It is difficult to get any further comment than this from them. Yet at different plants one will find quite different practices. Some operators will run their belts until the covers are gone, the carcass is rotten, and the belt pulls apart. Such practice frequently causes a shut-down until the belt is repaired. Other operators will become nervous when a belt nears its end of usefulness and for fear of an accident or shut-down will replace it while it is still in a condition such that the other operator would be glad to accept and use it. These are the extremes, of course, somewhere between them lies the true economic practice. It is difficult to determine just where this is. One might state the theory that a belt should be replaced when the cost of its operation, inspection, patching and repairs exceeds the cost of operation of a new belt. But this is only theory and the various

factors involved are difficult, if not impossible, to determine.

For example, one large conveyor belt had run three seasons at a total unit cost of about \$1.06 per 1000 cu. yds. carried. At the end of that time it was apparent that either a completely new belt was required or considerable repairing with new pieces was necessary. It was decided to repair the belt to avoid the large outlay necessary for a new belt. During the subsequent operating season the belt, even though repaired, was the cause of several shut-downs. At the end of that season it was found that the total unit cost for the four seasons was \$1.02 per 1000 cu. yd. This indicates that the extra season's wear was not worth while as a new belt could have been operated at practically the same cost and with freedom from possible costly shutdowns.

Worn belts may often give further service in conveyors where the stresses are small or where their failure would not cause the entire plant to shut down. Also a worn belt may be operated economically under favorable conditions but may not when these conditions change, for example, from favorable weather conditions to freezing, or from continual to intermittent operation.

An operator, trying to keep his belt costs down, will be wise to study them carefully with a few figures, rather than to remove them when worn on a basis of casual inspection alone.

(To be continued)

Chemists' Corner

(Continued from page 55) admixture used, and the percentage of the acid radical added as the compound, or (if so designated) as the whole compound. All additions are calculated as percentage by weight of clinker or cement.

In addition to the temperature data Table 2 contains time of set results. These were obtained with standard Gilmore needles on pastes of the same water content and percentage of admixture as used in the temperature determination. The pastes contained in receptacles $\frac{1}{2}$ in. in depth were cured in the moist cabinet.

Aluminum Salts (Group 1)

Aqueous solutions of aluminum salts added to cement clinker accelerated the reactions, as manifested by the higher temperatures at one hour, and by the increases in the rate of evolution of heat accompanied by

higher maximum temperatures. That the reactions were immediate was indicated by the fact that most of the pastes were quite dry after one minute's mixing.

The influence of these salts on the times of set was markedly governed by the type of clinker. Thus, Table 2 shows that the time of initial set of clinker 2 was drastically reduced by the two sulfates. On the other hand, clinker 3 with $K_2Al_2(SO_4)_4 \cdot 24 H_2O$ showed a delay in the initial and final set. Practically the same thermal effects were observed with clinker 3 regardless of the amount or kind of salt added in this group. Although an individual clinker, as No. 1, may show an earlier time of set the greater the temperature rise, in general no definite correlation was found between the time of set and the thermal changes.

(To be continued)

New Unit for Airport Job

THE ACME SAND & GRAVEL CO., San Antonio, Texas, has found it necessary to set up a new plant to furnish 80,000 cu. yd. of materials in 80 days for the new concrete runways and apron at Kelley field. This new plant has a 5-ft. Acme revolving screen, a 20-ft. scrubber, and a 3- x 8-ft. Simplicity triple-deck screen. A Northwest dragline is used for loading. Material hauled to a hopper is fed out by an Acme feeder to a 24-in. Acme conveyor, 80-ft. centers, and into a revolving scrubber. From the scrubber, material goes to a Simplicity screen. Sand is chuted to a dehydrator from which it is stockpiled at the rate of 100 cu. yd. per hour by means of an 18-in. conveyor, 80-ft. centers. Gravel from the screen goes to a 24-in. Acme conveyor, 80-ft. centers, and thence to a batching bin. Oversize, about 5 percent, goes to a worked out pit. Power is generated by means of a 100-hp. International Diesel engine.

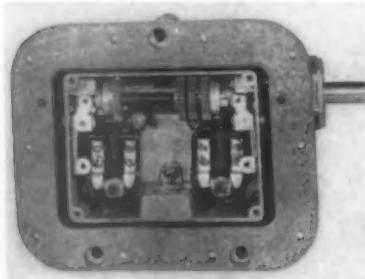
Irrepressible Henry J. Kaiser

THE WAR PRODUCTION BOARD recently announced that Henry Kaiser had been granted permission to construct a pig iron blast furnace with a daily capacity of 1200 tons. Exact location of the new plant has not been determined, but it will be in Southern California, WPB officials said. Mr. Kaiser's application also included rights to use iron deposits from Eagle Mountain and coal from Utah. A further application for a steel plate plant is pending and is expected to be acted upon favorably.

NEW EQUIPMENT

Rotating Type Limit Switches

THE GENERAL ELECTRIC CO., Schenectady, N. Y., has announced the addition of two new forms to its line of CR9441-C2 rotating-type limit switches. One form is for Class 1, Group D hazardous gas locations and the other is for applications requiring



One of the two new types of rotating-type limit switches

a water-tight switch. These switches are both housed in heavy, flanged, cast iron enclosures.

The mechanism of the switch is adjusted to operate the contacts between a minimum of one-half turn of the driving shaft and a maximum of 120 turns. It is said that indefinite overtravel will not harm the switch mechanism.

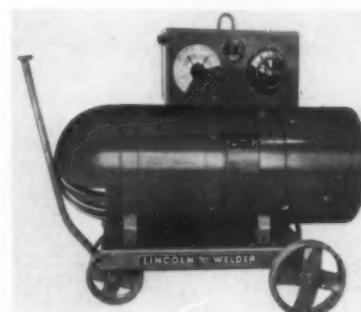
Double-break, fine-silver contacts clean themselves by opening and closing with a rocking motion. New contact tips can be installed with a screwdriver. One double-break contact is located at each end of the travel, and can be made normally closed or normally opened without additional parts.

Arc Welder Control

THE LINCOLN ELECTRIC CO., Cleveland, Ohio, has brought out an improved design of its "Dual Continuous Control" for arc welding machines which is said to eliminate the need for meters showing volts and amperes.

Welders so equipped have both job selector and current control calibrated and equipped with dials which indicate the type of work and the number of amperes for each and every setting. It is claimed that this feature enables the welding operator to secure high quality welds and rapid welding speeds because he can vary both the slope of the volt-ampere curve and the amount of welding current independently and positively to suit every job encountered.

Another feature claimed for this welder control is that both voltage control (job selector) and current control are continuous in operation, providing many combinations of volt-

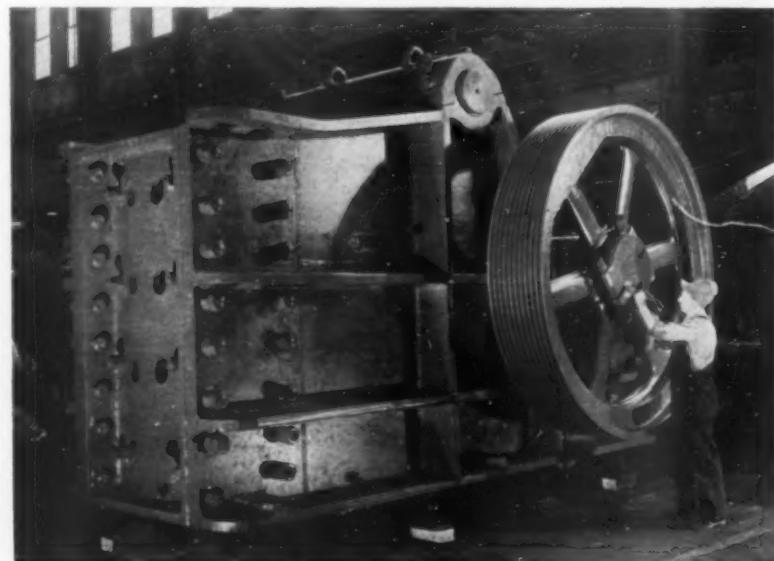


Welder designed for operation without the use of volt and ampere meters

age and current. An important advantage made available by this design is the ability to reverse polarity.

Large Jaw Crusher

ALLIS - CHALMERS MANUFACTURING Co. recently completed an all-steel ore and rock crusher of an entirely new design. This jaw crusher is one of several on order. The crushers are built with rolled steel, welded side frames to obtain greater strength and less weight. The new development will replace the older type of crusher made with cast iron frames and reinforced by steel tension bolts. Weighing approximately 130,000 lb., the

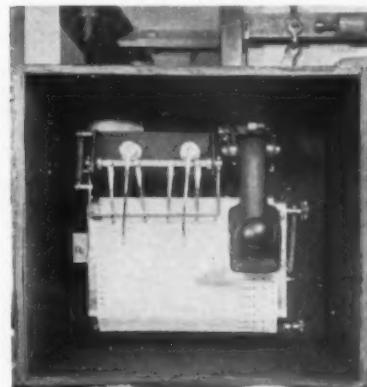


Putting the finishing touches to large jaw crusher built with rolled steel, welded side frames to reduce weight

crusher has a receiving opening of 42- x 48-in. One application of this unit is for the crushing of extremely hard ore.

Recorder for Batching

BLAW-KNOX COMPANY, Pittsburgh, Penn., designed an interesting automatic graphic recorder for weighing cement and aggregate in two separate weighing batchers equipped with springless dial scales. The recorder



Graphic recorder which provides an automatic record of the weighing of the aggregates and cement

includes a timer which automatically stamps date and time of day on graphic record every minute.

This record was used with dial scales for cement and aggregate weighing batchers on the Cornell-



Sly Dust Filter in a cement plant, typical of several thousand Sly installations in many industries for complete dust control. Sly is a 5 to 1 favorite in the cement industry.

SLY DUST CONTROL

MEANS CLEANER PLANTS,
BETTER WORKING CONDITIONS

"WE'RE very well pleased with this installation; it has meant a much cleaner place and better working conditions for the men," is how the cement company feels about it. The firm has been using Sly Dust Control the past 15 years.

This particular filter is the continuous type. It operates without interruption for shaking, as shown in the diagram at the left. Connected with the fine grinding (ball) mills, it saves the finer particles of cement otherwise wasted as dust.

Responsible for the uncommon efficiency of Sly Dust Control are the flat cloth bag filters. They clean the air completely by filtering the dust out of it. They even get the fine, penetrating dust *invisible to the naked eye*. These bags are held under tension (a patented feature) offering minimum resistance to air flow and assuring *complete* dust removal.

As specialists in dust control let us help you effect the savings possible through proper dust control. Write us fully so that we can give you complete information.

More than 5,000 in successful operation.

THE W. W. SLY MANUFACTURING CO. • 4746 Train Ave., Cleveland, Ohio



NEW EQUIPMENT

Young plant built for the Santee-Cooper dam project near Charleston, S. C. Specifications required that a graphic record be made of the actual weighing of the aggregates and cement for the porous concrete for slope paving construction.

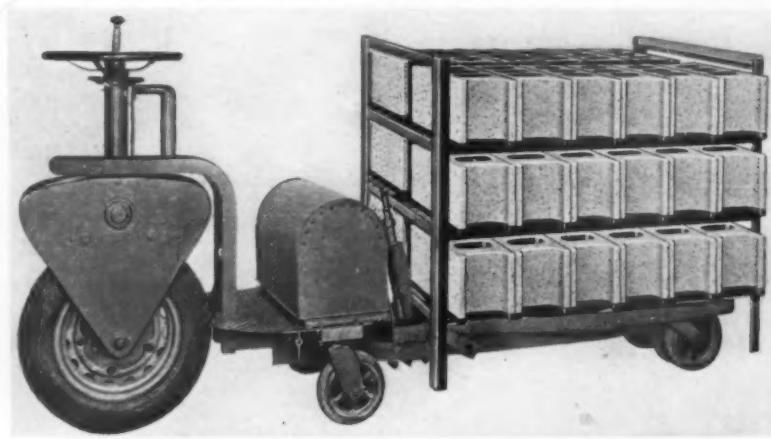
Hydraulic Separator

F. M. WELCH ENGINEERING SERVICE, Greenville, Ohio, has acquired the selling and manufacturing rights on the Allswede hydraulic separator for which patent applications have been made. Wm. H. Allswede, Hersey, Mich., is also the inventor of a scrubber.

Whereas the scrubber has been designed to remove clay balls, soft stone, shells, mud, etc., from gravel, the hydraulic separator removes light foreign matter such as sticks, bark, driftwood, shale, etc.

The accompanying illustration shows the approximate size and form of a unit suitable for handling about 50 tons per hour. It can be built larger and the elevator may be extended as high as desired to take care of larger capacities.

In operation, gravel containing light deleterious matter is fed into the feed box where it falls through the 10-in. pipe into the 24-in. pipe and through it to the elevator boot. The proper amount of water (say 1000 g.p.m.) is simultaneously introduced through the 6-in. spray pipe and its only out-



Electric motor driven truck having an unusual driving mechanism

let is up through and over the top edge of the 24-in. pipe to the refuse discharge box. Clean gravel is picked up by the elevator which is equipped with perforated buckets and discharged as indicated on the drawing.

Power-Propelled Truck

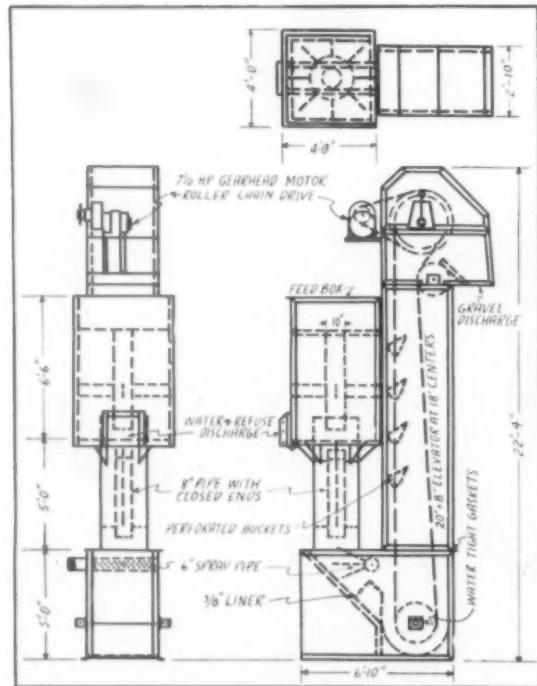
MILNER-RABER CO., INC., Indianapolis, Ind., has introduced two types of power-propelled trucks, both with the trade name of Motorjack. The electric motor operated unit is said to be very light in weight, but is capable of moving loads up to 4000 lb. The electric motor is directly connected to the driving mechanism and steering unit, and the batteries can be charged

without removing. No reverse gears are required with this driving mechanism. Its construction also permits turning around within its overall length.

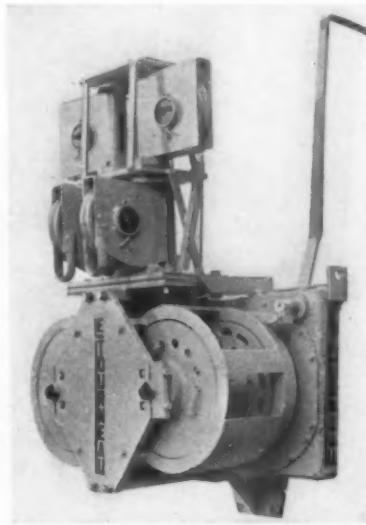
A similar unit with the gas engine mounted on the front wheel also is available. This unit has the same hauling capacity as the electric motor driven truck.

Power Control Unit

R. G. LETOURNEAU, INC., Peoria, Ill., recently announced its R6-7-8 power control unit for mounting on either



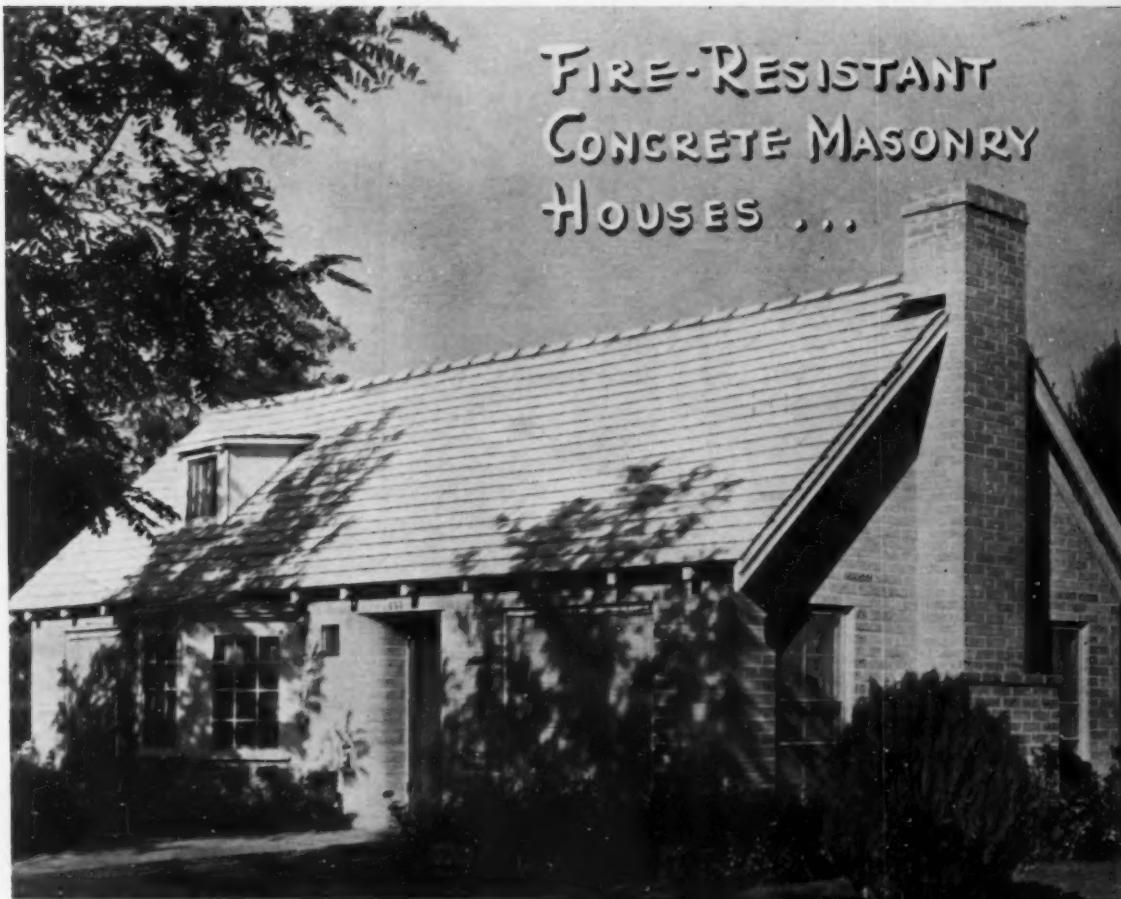
Construction details of hydraulic separator which is designed to remove sticks, bark, driftwood, shale, etc., from gravel



Face plate of power control unit drilled to fit mounting holes on three types of tractors D6, D7 or D8 Caterpillar tractors. With a line pull of 5000 lb., it is claimed that the largest loads are handled easily. Having larger brakes and clutches, there is faster heat dissipation through larger exposed area on brake drum; more cable capacity; longer cable life.

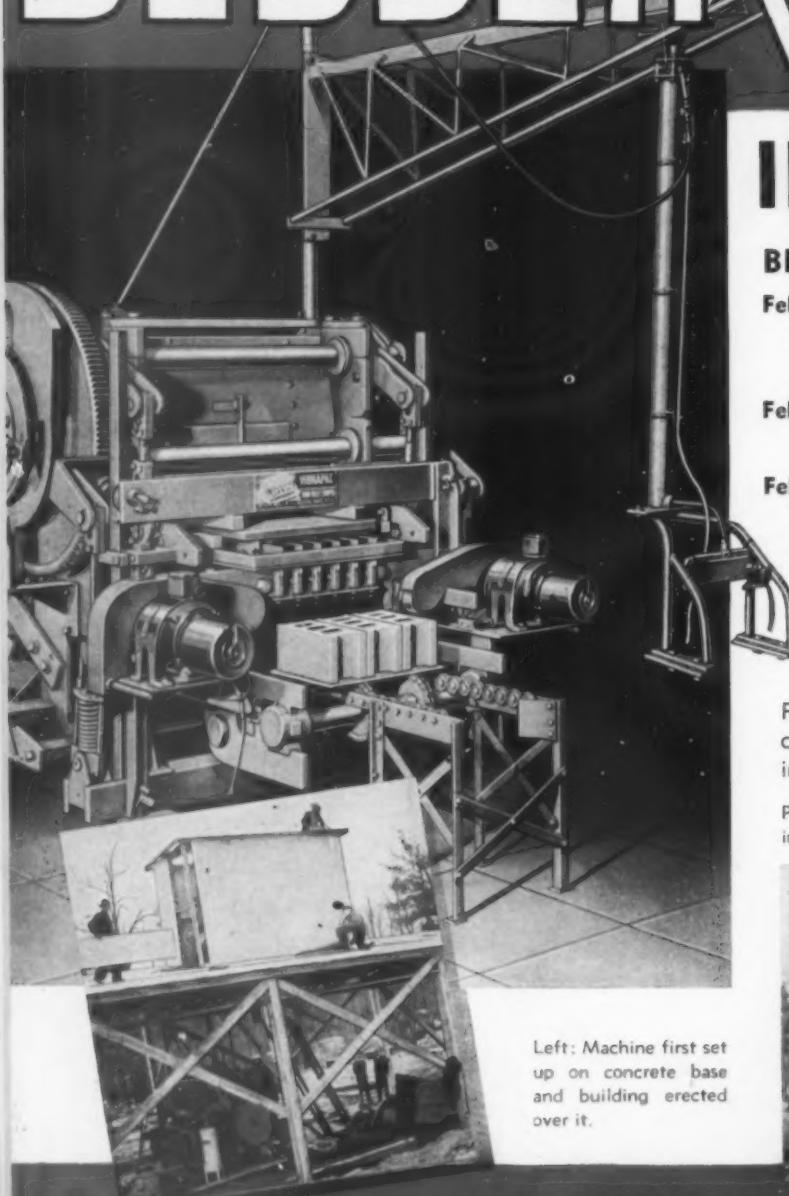
CONCRETE PRODUCTS AND CEMENT PRODUCTS

FIRE-RESISTANT
CONCRETE MASONRY
HOUSES ...



Typical California home constructed with concrete
masonry units made with pumice aggregate by Jourdan
Concrete Pipe Company

DIARY of a BESSER VIBRAPAC



Left: Machine first set up on concrete base and building erected over it.



Undirectional vibration under Flam patents (other patents pending) was employed to make the first vibrated blocks ever produced commercially. The Besser Vibrapac combines undirectional vibration with the exclusive Besser Plain Pallet principle. Users of these machines are fully protected under Besser and Flam patents.

BESSER MANUFACTURING CO.

204 FORTY-SECOND STREET

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

INSTALLATION

BESSER ANSWERS EMERGENCY CALL

February 2, 1942

Stockbridge Stone Co., Stockbridge, Ga., ordered Besser Super Unitized Plain Pallet Vibrapac.

February 6, 1942

Besser Super Vibrapac shipped from factory.

February 9, 1942

Building operations on plant started.

February 13, 1942

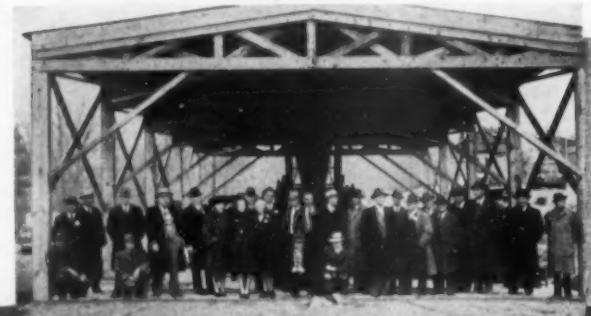
Besser Vibrapac placed on foundation.

February 17, 1942

Plant in production.

For big production and emergency installations the concrete products industry more and more is depending on Besser Vibrapacs.

Picture below shows men attending Convention at Atlanta inspecting the Stockbridge plant February 18, 1942.



BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated	8 Hr. Capacity 250 to 350

VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160

Besser Master Vibrapac, Hand Operated, 8 Hr. Capacity 800

Selling Concrete By Specification

Design mixes which will meet demands for all types of concrete requirements

By RALPH S. TORGERSON

To complete its line of building material supplies, Gottron Bros. Co., Fremont, Ohio, decided to go into the ready mixed concrete business. While this company is primarily engaged in the production and sale of crushed stone, it also is a dealer in sand and gravel, cement, and other building materials.

Although the new ready mixed concrete batching plant has been in operation only a short time, the demand already has kept the plant at capacity operations for a good share of the time. Considerable study was made of the new business before operations were started with the result that the company had products to sell which would meet practically every requirement for concrete. The various mixes

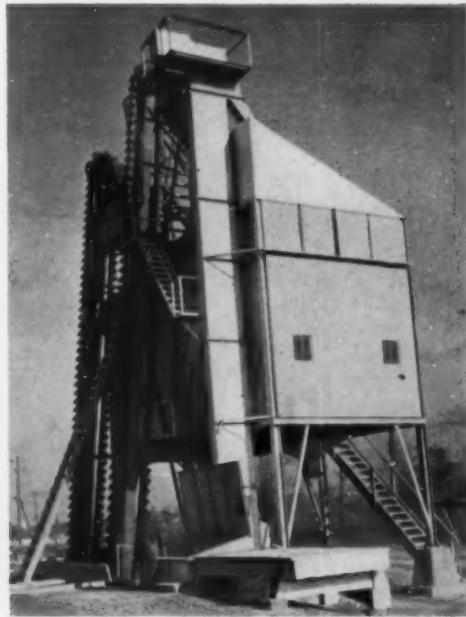
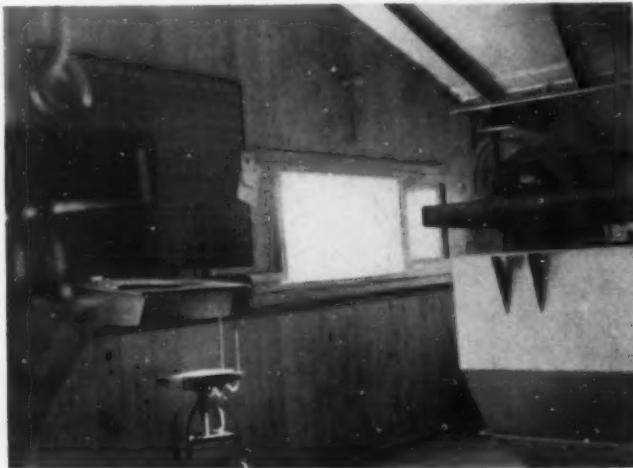
comprising different combinations of cement, types of aggregates and water-cement ratios, were worked out in advance so that a contractor could get exactly the kind of concrete he wanted for a particular job.

To make the task of the batching plant operator easy, a chart was made up on a blackboard on which was written in the various mixes and the types of aggregates, weights of materials, etc., of which they were com-

(Continued on page 66)

Right: Aggregates for the plant bins are dumped by trucks into hoppers feeding into the boots of the belt bucket elevators. The enclosed elevator in the foreground elevates bulk cement to the bin above

Below: On blackboard opposite batcher are listed all the various concrete mixes with weights of aggregates and cements, etc.



CONCRETE PIPE

Making A Porous Concrete Pipe



Part of large storage yard for all sizes of concrete pipe made by the Jourdan Concrete Pipe Co. Plant in the background

WHEN THE CENTRAL VALLEY PROJECT is completed a large area of land that has a low productive value at present will be placed in the higher brackets of productivity. Land that is now reasonably productive is gradually slipping back and were it not for the eventual raising of the ground water levels from the waters of the Central Valley Project, some two million acres of land would, in time, become useless for the crops that require irrigation. When the project is completed it is hard to say how many new homes will be created and how many new business enterprises established in the area, but unquestionably it will be large. In the Fresno, Calif., area, the Jourdan Concrete Pipe Co. is well aware of the ultimate good that will come to it, as well as other businesses, from this far-sighted project.

At the moment, however, the Jourdan Concrete Pipe Co. is primarily concerned with that ever-present and extremely noticeable up-swing of business due to national defense. At first glance one wonders just what part the concrete products business plays in the defense program. However, on a modern bomber base, for instance, the need for concrete pipe for drainage alone is of extreme importance.

An airplane base as a primary essential must be a more or less flat

By WALTER B. LENHART

Special Pipe made by Jourdan Concrete Pipe Co. to drain seepage from Friant dam. Also makes a fire-resistant pumice concrete masonry unit

area. When heavy rains fall, as they do in the winter months in the Central Valley area, such areas can become worthless shallow seas of mud and water—a distinct liability as an

air base for our heavy bombers. Ample drainage is the answer—and concrete pipe is doing the job. For several months, the Jourdan Concrete Pipe Co. has been manufacturing concrete pipe for airports in the San Joaquin Valley.

A second large use is for sanitary (sewerage) disposal purposes for the runways of a modern air field are only a very small but necessary part of the program. There are shops for repairs, gasoline depots (filling stations for airplanes), barracks by the score, offices, and officers' quarters in such profusion that a modern base is a small city in itself.

New office building constructed with the company's Pumitile units



ROCK PRODUCTS

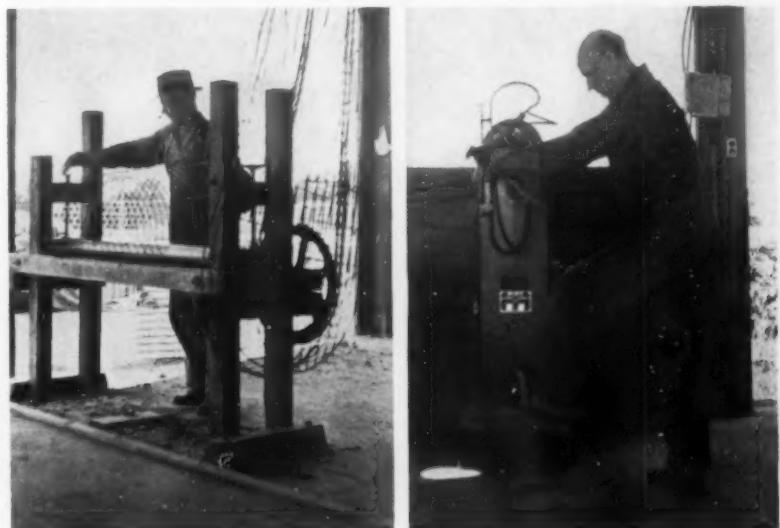
CONCRETE PIPE

Porous Pipe Drains Water Seepage from Dam

As the Central Valley Project itself has been declared a defense project, there is a third and interesting use for porous pipe that is being manufactured at this plant in considerable quantities. In fact it keeps one Tuerk-MacKenzie pipe machine busy. This pipe is of small diameter and is being placed in the Friant dam so as to drain any seepage that may be present in the concrete mass itself, to a point where such water can be disposed of.

On the upstream face of the dam, and at 10-ft. intervals, vertical columns of these porous pipe are being placed in the concrete poured around them. The Bureau of Reclamation keeps an engineer at this plant who makes up cylinders from the concrete used and tests them for porosity. He also makes up other cylinders for breakage, and other tests.

To test these cylinders for porosity, a 12-in. (high) and 4-in. diameter cylinder is mounted in a special metal jacket, the top of which extends above the top of the test cylinder exactly four inches. Water from a constant head tank is then allowed to flow into the top of this assembly, which essentially amounts to having 4 in. of head on the test block. The water that passes through the pipe itself is caught in a container. This water is then weighed and the porosity reported as so many pounds of water per minute. Specifications require that at least the equivalent of 7 g.p.m. of water per square foot pass through the test block. An average of 10 gal. is maintained with 13 gal. not being



Left: Rolling cage wire for pipe reinforcement to required diameter before spot welding.
Right: Special electric welding equipment to spot weld wire

out of the ordinary for this test.

The mix for preparing this product is as follows: (ratios) gravel, 6.27; cement, 1.00; pumicite, 20; calcium chloride, .03; and water, .41.

The gravel is one-half pea size (No. 4 to 5/16-in.) and one-half crushed rock (No. 4 to 3/8-in.). No. 4 is a coarse sand. This gives a very dry mix but on the pipe machine, which uses one tamping bar, the metal jacket (form) can be removed after setting on the curing floor a few minutes. Bottom rings are not removed for 24 hours or more. A special and richer mix containing sand is used for the tongue and grooved ends.

Larger pipe (30-in., 36-in. and 42-

in. diameter) are made on a machine similar to that making the porous pipe except that it has two vertical tamping bars, one on each side of the reinforcing cage. A rather dry, one-to-four mix and high-early-strength cement is used for these pipe.

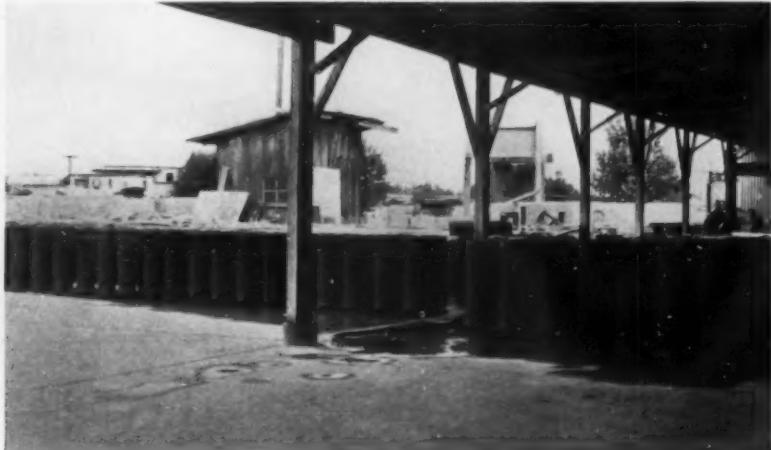
Concrete mixers for both these machines set level with the main floor and there is a water-measuring device above each mixer. Mixers are discharged by a hand gate to an inclined drag conveyor that elevates and conveys the concrete to the machine forms. Any spill is caught by a 6-in. belt conveyor and returned to the mixer so that no wastage is permitted.

Reinforcing cages are made up

Testing porosity of special concrete pipe for dam drainage



Porous concrete pipe for dam drainage being cured under cover in sheds. Testing equipment and plant to the rear



from Clinton electric-welded fabric furnished by the Wickwire-Spencer Steel Co. from rolls that weigh from 300 to 400 lb. and which are received at the plant in truck lots. Plain finish, 2- x 8-in. mesh wire is used. Longitudinal and cross wires vary in size with the area of reinforcement required for each size and type of pipe. These rolls come in standard widths.

Cage wires are cut to required length and rolled to the proper diameter after which they are spot welded with a Victor electric welder. This device has two carbon elements, the handles of which are water cooled. Two pieces of wire to be welded are pressed, via a foot lever, between the carbon elements and the resistance offered the electric current spot welds the two wires together. A cage can be welded in a very short time by this machine.

Fire-Resistant Pumitile

In the Fresno area are large deposits of pumice. This material which is essentially a pizzolana ranges in size from about 98 percent minus 325-mesh, up to coarse volcanic pebbles and rubble. At the Jourdan Concrete Pipe Co. a considerable concrete products business has been built up in a product called "Pumitile" which is trademarked.

Pumitile has the advantages of being light in weight; 100 lb. per cu. ft. whereas ordinary concrete weighs about 150 lb. Crushing strengths for a monthly average were 1500 p.s.i. whereas the code requires 700 p.s.i. for standard tile and 1000 p.s.i. for special. Pumitile are extremely fire-resistant and exceed all code requirements. Conductivity of Pumitile is very low, being 1.62 B.t.u. per sq. ft. of area per inch of thickness per degree difference in temperatures per hour. Common clay brick are 5.00 and concrete 12.00 as expressed by the same standards.

Pumitile are available in 4-in., 6-in., and 8-in. wall widths, and all units are 3 $\frac{1}{2}$ -in. high. Many beautiful homes and commercial buildings of all types have been built in the Central Valley area from Pumitile, and a larger growth is expected.

Pumitile are made on a Stephen Flam vibrating machine. Two kinds of pumice are used, one white in color for workability and a red-tinted material for strength. The crude material is trucked to the plant from the deposits nearby.

The Jourdan Concrete Pipe Co. has an unusually large and neatly arranged assortment of pipe and tile at its yard on highway 99 near the

northern outskirts of Fresno. H. W. Chutter is manager, and S. L. Hamilton is in charge of the office. Mr. Chutter was formerly president of the American Concrete Pipe Association, and he also is president of the California Association.

Selling Concrete By Specification

(Continued from page 63)

posed. When an order for concrete comes in, it is a simple matter to refer to the board for this information.

Illustrations show features of the plant and the truck mixer equipment. Three 2-cu. yd. Jaeger transit mixers are mounted on Ford chassis. The plant is equipped with two Blaw-Knox 55-ton batchers. One of the batchers with a three-beam scale is used for aggregates, and the other having a two-beam scale is used for cement and screenings. Water is introduced into the mixer drum from the regulation type tank on the trucks.

Speed Up Cement Flow by Compressed Air

Any tendency for cement to hang up in the batcher hopper has been largely eliminated by fluffing the cement with compressed air within the hopper. A Curtis compressor operated by a 2-hp. Howell electric motor is connected to a compression tank from which a pipe leads to the cement batcher hopper. Several small sections of pipe T off from the main line into the hopper at a point low down where the air may circulate freely through the cement mass by opening a valve.

The plant itself has some interesting features. Mixer trucks receive

aggregates from the spout of the first batcher and then move over to the second batcher spout for cement. Aggregates are dumped by trucks into hoppers feeding three belt bucket elevators which carry them to the batch bins above. Two of the belt bucket elevators, about 45-ft. centers, are for stone, stone sand, or river sand with swiveling spouts above to divert the materials into the proper bins. The third belt bucket elevator is enclosed for the purpose of conveying cement in bulk from the covered storage bin below.

Officers of the company are Harry P. Gottron, president; P. C. Gottron, secretary; and A. F. Gottron, treasurer. O. Miller is superintendent.

Texas Ready Mix Concern Has Rapid Growth

V. J. KEEFE, San Antonio, Texas, who entered the ready mixed concrete industry three years ago with one mixer truck, now operates a fleet of 11 mixer trucks and 18 motor dump trucks. Three plants with a capacity of 700 cu. yd. of concrete are kept busy furnishing concrete to war projects in Texas. Mrs. Keefe also has taken an active part in building up the business. One recently completed job involved 100,000 cu. ft. of concrete for warehouses.

Burial Vault Convention

A TENTATIVE PROGRAM has been arranged for the convention of the National Concrete Burial Vault Association to be held at the Hotel Cleveland, Cleveland, Ohio, June 9, 10 and 11. There will also be an exhibit. The first day will be devoted to registration, President Huber's address, roll call of members, secretary-treasurer's report, and the report of the nominating committee and election of officers, questions and answers roundtable at luncheon, and a talk on priorities. P. M. Woodworth, engineer, Portland Cement Association, will lead in the discussion. The second day will be devoted to a visit to the exhibits, and a discussion of materials and supplies led by the manufacturers. Secretary Ralph Mead has promised that the ladies will be well entertained, and that the banquet will live up to all past traditions.

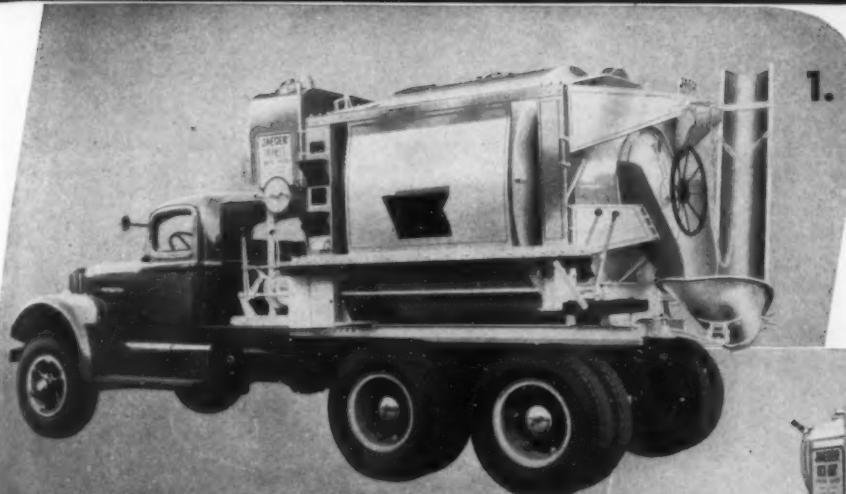
Erect Ready Mix Plant

SOUTH TEXAS MATERIALS CO., INC., Corpus Christie, Texas, has erected a new ready mixed concrete plant near the site of a new defense plant in Texas. It has a capacity of 50 cu. yd. per hour, and is now busy on a 20,000 cu. yd. contract.



Compressor and pressure regulating tank with pipe lines to cement batcher supplying air to fluff cement

Only JAEGER Equips You to Meet EVERY Ready-Mix Demand



1.

Standard LOW CHARGE

Type: Lowest, most economical to load; fastest on the market to mix and discharge — produce maximum daily yardage of proven higher strength concrete. Sealed drum meets any specification. Sizes 2 to 8 cu. yds.

All Jaegers Have 2-Speed Shock-Proof Transmission—Vacuum Cab Controlled Truck Engine Drive or Separate Engine

HIGH DUMP Types:

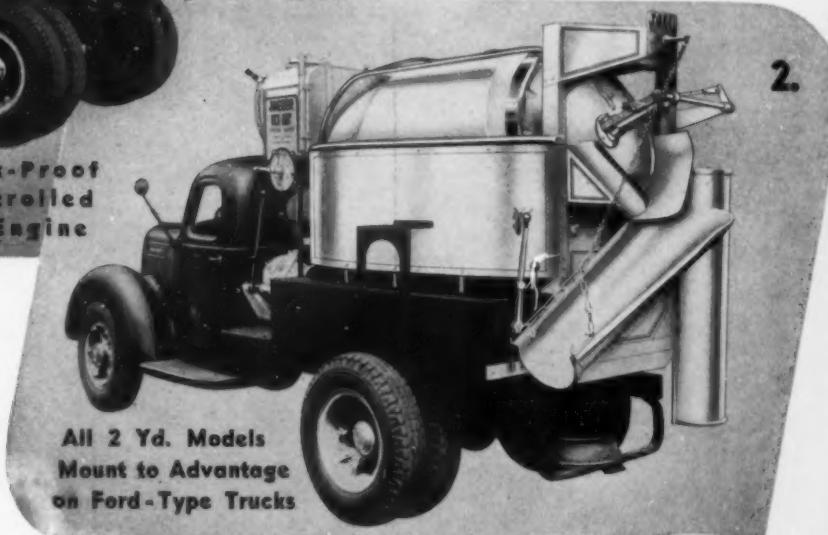
- (2) Top Loading Models with "Sealed Drum"
- (3) Or Combination Top and End Loaders (Pat'd)

Far outselling all other high discharge truck mixers today because they are fastest to load, mix and discharge any slump concrete — and are the only high discharge truck mixers that meet every specification and job condition.

"Sealed Drum" Models take full load in one quick drop through the top. Fast Vacuum-Controlled Discharge Door seals against loss of moisture and heat in winter concrete.

Jaeger End Loading Hopper Attachment (specially adapted to older or temporary plants not equipped for ribbon loading) offers many advantages over all other end loaders — and does not interfere with use of Top Loading Door where specified by engineers. (See details at right.)

Both types are built in 2, 3, 4 and 5 yd. sizes.



All 2 Yd. Models
Mount to Advantage
on Ford-Type Trucks



The only end-loader which does not constrict drum opening and slow up charging and discharge. One quick turn of hand wheel opens Discharge Gate — no need to move entire Hopper (requiring many turns of a wheel) — no second seal to leak or wear.



JAEGER PORTABLE HOPPER

Saves Truck Mixers Waiting—Means 25% More Pay-loads per Day on Average Job. Tows to job behind truck mixer—takes full 2 or 3 yd. batches. One hopper serves almost any job.



THIS HANDY BLANK BRINGS YOU FULL INFORMATION:

Complete Data, Models, Specifications, Prices, Terms

THE JAEGER MACHINE COMPANY 803 Dublin Avenue, Columbus, Ohio

Send us newest information on Standard LOW CHARGE Truck Mixers, Agitators, HIGH DUMP Models, Portable Hoppers, Auto-Pavers and Spreaders, Pumps, Mixers, Hoists, Carts.

Name _____

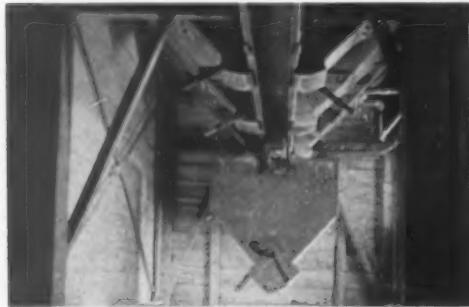
Address _____

Fluorescent Lighting for Block Plant

May Sand and Gravel Co. builds up under cover storage for 65,000 units

WHEN the May Sand and Gravel Co., Fort Wayne, Ind., went into the concrete products business about a year ago it was decided to equip

It was a strategic move as the new Studebaker airplane engine factory took a large quantity of units, and there has been a consistent demand



Above: Traveling batch hopper moves aggregates from bins to mixer on gallery over block machine



Right: Vibrating type block machine with pallet oiler to the left. Above may be seen fluorescent lighting and fan over machine

the plant with modern machinery and build up a large stock of every size for which there may be a demand.

for the company's products from contractors building residences to meet the acute housing situation which

Portable mixer to supply concrete for pouring concrete septic tanks and other outside jobs

Finishing concrete septic tank, showing one end of welded steel gantry with hoist and trolley to handle forms and finished products



followed the influx of new workers.

Both sand and gravel and light-weight Waylite blocks are made in the standard sizes as well as 4- x 8- x 16-in. and 4- x 4- x 16-in. partition block, and rock face block are made on an old Anchor machine. Chimney block are also made in quantity. A stock of approximately 65,000 units in all sizes is kept on hand under covered storage. In addition to concrete block, the company makes 8-, 10- and 12-in. concrete joists by the hand tamp process, and also pours large concrete septic tanks.

Under cover storage is of the most modern type with steel truss and pillar construction supporting a corrugated metal lean-to type of roof.

The plant itself is of concrete block with four concrete block steam curing rooms with a capacity of 3000 units in eight hours. An Iron Fireman stoker fires the boiler supplying steam at 35 p.s.i. Block are made on a Stearns Joltcrete with a capacity of six units per minute. An interesting feature about this machine is the use of fluorescent lighting directly over the machine. There also is a fan above the machine which adds greatly to the comfort of the men during hot weather. Directly above the block machine supported on a wooden platform over steel I-beams is the 21-cu. ft. Stearns mixer which dumps the mixed concrete into the block machine hopper below.

Above the mixer is a monorail extending back into the adjacent room below a steel bin having three compartments with manually operated

CONCRETE MASONRY



Two special sizes of block or concrete tile which are coming into increasing use

slide gates to release aggregates into a batch lorry. About 45-cu. yd. of aggregates are stored in this bin.

In one of the illustrations is shown the $\frac{1}{2}$ -cu. yd. Rex portable mixer for yard jobs, such as the pouring of large septic tanks. Another illustration shows the arrangement for handling large septic tanks. Two steel pipe A-frames suitably braced support the I-beam monorail on which a Yale and Towne chain hoist travels.

Officers of the company are William May, president; and Raymond Fairfield, general superintendent. Henry Hugenell is superintendent of the concrete products plant.

Powdered Rock in Concrete

GERMAN OFFICIAL SPECIFICATIONS for the construction of concrete pavements permit the addition of powdered stone in a proportion not exceeding 2 percent of the total weight of the aggregates. Since the minimum proportion of fines in the mix is fixed at 3 percent, the aggregates should themselves contain at least 1 percent. The fact that this proportion is seldom present in river sand or washed sand calls for some modification in the specification requirements. Other German specifications demand from 3 percent to 8 percent of fines.

The author compares the properties of seven types of powdered stone in use in Silesia. The cements used in concrete pavements in this area are described as "standard," as distinct from "road" cements, and the proportion of fines usually employed is 4 to 5 percent. It has been found that

higher and lower proportions result respectively in an undesirable amount of laitance and in the separation of water at the surface.

Locally available types of powdered stone include trass, powdered basalt, Oderwalde sand, two types of hydraulith (a local basaltic tufa), powdered limestone, and Thurament (a product similar to trass). A series of comparative tests was carried out on concrete containing 617 lb. of cement per cu. yd. with mixes containing 0, 3, 5 or 7 percent of powdered stone. The properties tested included the compressive strength of cubes at 7 and 28 days, the bending strength of specimens 40 in. by 4 in. by 4 in. at 7, 28 and 90 days, and of specimens 28 in. by 6 in. by 4 in. at 28 days, and the shrinkage at 7 and 28 days, 3 months, and 6 months.

The following conclusions were reached: (1) For the cement content employed the optimum proportion of added filler is usually above the official specified maximum of 3 percent; the concrete is usually improved by increasing the proportion of fines up to a total of 5 percent. (2) The amount of shrinkage was greatest when powdered limestone or hydraulith was used, and was least with Thurament and trass. (3) The highest bending strengths were observed when the proportion of filler did not exceed 5 percent, though the filler content of the shorter beams could in some cases be increased to 7 percent without causing an appreciable reduction in strength. (4) The compressive strength was lowest when limestone or sand was used, and highest with Thurament, trass and powdered basalt.—*Highway Research Abstracts*.

Concrete for War Jobs

BIG ROCK STONE & MATERIAL Co., Little Rock, Ark., has contracts calling for a total of 150,000 cu. yd. of concrete for two ordnance plants in Arkansas. Batching plants have been set up at both locations, and concrete is being transported in 30 ready mixed concrete trucks with 2-cu. yd. mixers. The work will be completed sometime in May.

Sell Company

DODSON MANUFACTURING Co., Wichita, Kans., has purchased the Dehner Concrete Co., Concordia, Kans., from Mrs. W. A. Dehner. It is reported that Fred Woodring, a member of the Dodson sales staff, will become manager of the former Dehner plant.

While the Dodson company has specialized in concrete silos and building block, it is believed that they will continue to make reinforced pipe in Concordia.

Making Big Pipe

THE UNIVERSAL CONCRETE PIPE Co., with headquarters at Columbus, Ohio, has built a new plant at Waco, Texas, and is now constructing their twenty-third permanent plant at San Antonio, Texas. Pipe from 6-in. to 135-in. in diameter are made.

This company is making 120-in. and 135-in. pipe, both of unusual size for the industry. The 120-in. pipe has a 12-in. wall and weighs 5120 lb. per linear foot; the 135-in. pipe has a 13-in. wall thickness and weighs 6200 lb./lin. ft., and is being used under a 60-ft. fill. This is said to be the first time this size pipe has ever been made. Special equipment was made in the company's shops for this pipe.

Another large contract held by this company calls for the delivery of 11000 tons of pipe for the Lockbourne Air Base in Ohio, with the possibility of an additional 4000 tons of pipe which must be delivered in 45 days. This will call for a production of 300 tons per day requiring two casting machines and a third machine may be installed. Another contract involves 13,000 tons for the Clarksville Cantonment in Tennessee and about double this amount for the Smyrna air base. Large size pipe will be furnished for culvert purposes.

Block for the Army

THE DUROCRETE BLOCK Co., San Antonio, Texas, owned by H. T. Speegle, a new concern in the field, is busy furnishing block for hangars and airplane loading docks for two Texas airfields and also for a new arsenal warehouse.

Making Septic Tanks

THE ACME CONCRETE PRODUCTS Co., Jacksonville, Fla., has opened a plant here for the manufacture of concrete septic tanks and grease boxes. George Sresovich is in charge. This enterprise is a branch of the Interlock Septic Tank Co., Miami, Fla. The septic tank business has been a big business in Miami with thirteen firms having a gross turnover of approximately \$1,000,000 annually. Tanks are handled by one man using a truck equipped with a trolley, I-beam, and derrick.

Resistance to Rain Offered By Masonry Walls

AT BOTH the Kansas City, Mo., and Atlanta, Ga., regional meetings of the National Concrete Masonry Association, held respectively on February 2, 3, 4 and February 16, 17, and 18, the subject of the prevention of leaky masonry walls was given prominent attention on the programs.

Paul M. Woodworth, of the Portland Cement Association, led the discussion. He pointed out that furring is the best insurance against the possibility of moisture penetration through masonry walls, but he cautioned that this should not be construed to mean that sound principles of building watertight walls should be compromised.

Results of Tests

Mr. Woodworth described the 200 permeability tests made by the P.C.A. laboratory simulating the most severe wind and rainfall conditions encountered in the United States. These tests were made on 101 "wallettes" 32 in. wide, 48 in. high, and 4-in., 8-in., and

12-in. thick. The accompanying illustration shows the common types of 8- and 12-in. walls included in the tests.

These tests indicate that neither 8-in. or 12-in. solid walls of common brick offer effective resistance against penetration of rain even though good workmanship and good mortar is employed. The use of face brick on the exterior of 8-in. and 12-in. walls erected with excellent workmanship gives these walls sufficient added protection to warrant an excellent rating. Even though a wide range of types and qualities of concrete masonry units were employed, test results were unfavorable, unless the walls were protected with portland cement paint or stucco.

Conditions of the tests were more severe than those encountered in actual service as indicated by the fact that units made with well graded sand and gravel aggregate, W. L. Matthes, after the usual shut-down having a strength as high as 2300

p.s.i. gross area and absorption under 6 percent, gave poor results although the service record of walls of that quality has been satisfactory.

However, the tests show that in the case of all types of concrete masonry walls, two coats of portland cement paint, properly applied, results in a wall with an excellent rating. Tests show walls of this type to be on a par with solid 8- and 12-in. face brick walls and much superior to solid 8- and 12-in. common brick walls. The effectiveness of three coats of portland cement stucco applied to the exterior of concrete masonry walls was demonstrated by the fact that the wall of this type gave excellent performance even though subjected to 219 hours of test exposure.

Resume Production

ALPHA PORTLAND CEMENT Co. has started up production at its Manheim plant, according to Superintendent down for repairs and overhauling. Operations were not resumed until June in 1941.

SUPERIOR PORTLAND CEMENT Co., Concrete, Wash. plant, resumed production after the customary shutdown for repairs.

RELATIVE RESISTANCE TO RAIN FOR VARIOUS TYPES OF MASONRY WALLS

Concrete Masonry	Solid Brick	Brick Facing Conc. Mas. Backup	Brick Facing on Edge Conc. Mas. Backup	Solid Brick	Brick Facing Concrete Masonry Backup
8"	8"	8"	8"	12"	12"
Plain VP	Av/W Com VP	Av/W VP	Plain VP		
Crazed Units - P	Ex/W-C/M- Com P				
Pin hole paint - F	Ex/W-B/M- Com F Av/W-B/M-Face F Ex/W-C/M-Face F		Thru Header F	Av/W-B/M-Face - F	Av/W-B/M-Face F
	Av/W-A/M-Face G Ex/W-B/M-Face G				
Slight Crazed Pt - G					
Good Paint E	Ex/W-A/M-Face E			Ex/W-Face - E	Ex/W-Face E
P.C. Stucco E					

Showing various types of masonry walls tested by Portland Cement Association

CEMENT DISPERSION

Saves PRECIOUS DAYS and IMPORTANT DOLLARS!



"Pozzolith Saved Days and Dollars" Writes General Contractor
"Aviation plant "in middle west". Archt.—Albert Kahn, Inc., Detroit, Mich.
"Having a very workable concrete, coupled with High Early Strength qualities,
we were able to speed up construction, which permitted a more rapid re-use
of our forms, shores, etc., and effected a savings in labor and material on
the job." F. H. Martin Construction Co., General Contractor, Detroit, Mich.

MANY of the men responsible for great defense projects know from experience the high importance of Cement Dispersion in gaining maximum construction speed, thereby saving precious days.

Experience has also proved to them that along with greater construction speed, Cement Dispersion brings measurably lower costs. These benefits come from the fact that Pozzolith, through Cement Dispersion, greatly increases the efficiency of cement. (See explanation lower right "How Cement Dispersion Works".)

What are the concrete requirements you are most interested in for a particular job? Are they speed . . . strength . . . placeability . . . watertightness . . . durability? Then investigate Cement Dispersion.

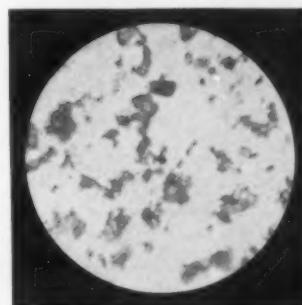
Learn more about the advantages of Pozzolith for all concrete construction. Send for Research Paper No. 36 "Economics of Cement Dispersion" and Pozzolith booklet.

THE MASTER BUILDERS CO.
CLEVELAND, OHIO TORONTO, CANADA

HOW CEMENT DISPERSION WORKS

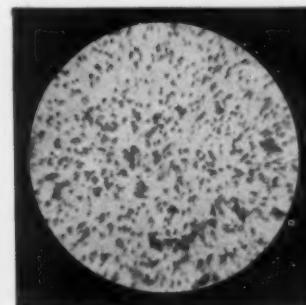
Only a part of the cementitious value of the cement, whether normal portland or high early, is utilized under usual construction conditions. Investigation shows that with 28 days curing only 50% hydrates. [Anderegg and Hubbell, A. S. T. M. 29 II 554 (1929)].

Dispersed cement produces 25% to 40% higher compressive strengths.



Cement suspended in water
UNDISPERSED

WITHOUT POZZOLITH



Cement suspended in water
DISPERSED

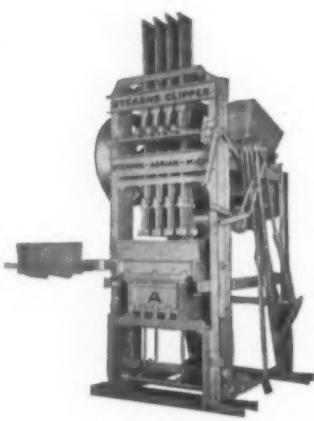
WITH POZZOLITH

In a normal concrete mix, cement particles tend to bunch together, thereby (1) limiting hydration and (2) trapping water within the cement clumps. (See photomicrograph above).

Cement Dispersion drives these particles apart and (1) exposes their entire surface area to hydration, at the same time (2) making the water entrapped in the clumps available for lubrication of the mix. (See photomicrograph above)

MASTER BUILDERS





"ANCHOR"

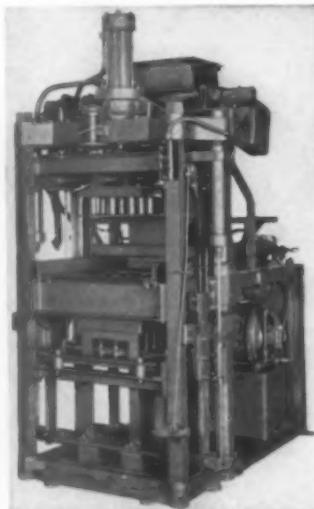
Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Hobbs block machines, Anchor tamers, Anchor Jr. strippers, Stearns power strippers, Stearns Jolcrete, Stearns mixers, pallets, Straubox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mch. Co.

G. M. Friel, Mgr. Columbus, O.

HYDRAULIC VIBRA-PRESS



A High Production Machine Making Blocks which are Demanded by the Contractor Endorsed by the Architect Desired by the Mason

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

Portland Cement Industry in China

ACCORDING TO the Foreign Minerals Quarterly, U. S. Bureau of Mines, domestic production of portland cement in China had reached 450,000 metric tons in the pre-war year of 1936. Nine of the largest cement plants in eastern China came under Japanese influence during 1937-1940. Five of the plants in North China, with a total capital of yuan 16 million had an annual production of 337,790 tons in 1939 that was expected to increase to 400,000 tons in 1940 by the opening of two new plants. However there was little progress in the expansion of cement production by Japanese interests in North China during 1940.

The Chinese-owned Chee Hsin Cement Co. at Tangshan, Hopei, operating at capacity, chiefly for consumption of Japanese interests, produced 1,548,935 bbl. (375 lb. each) during 1940, comparing with 901,325 bbl. in 1939. American machinery purchased in 1940 will increase capacity 30 percent when it is installed. Japanese operators control all the former Chinese owned plants, of about 2,000,000 bbl. annual capacity, in the lower Yangtze Valley.

Exports of cement during 1940 equalled about 3,500,000 bbl, all of which originated in the occupied areas. Production in unoccupied China was 287,000 bbl. For the whole of China upwards of 3,800,000 bbl. were produced during 1940. Japanese press sources announced, in February, 1941, that a cement mill operated at Liulihuo, Hopei, by the North China Cement Co. as a joint enterprise of various Japanese cement works would increase its capital from Yen 10 million to Yen 20 million.

In May, 1939, the Ministry of Economic Affairs of the Chinese National Government established a Cement Control Commission to supervise and give technical and financial help to cement mills and to control the selling and consumption of their output. The demand for cement in West China of 897,000 bbl. annually is far in excess of present output. Distribution between June, 1939, and December, 1940, was 29.3 percent for military construction, 38.9 percent for communications, 19.5 percent for industrial use, 5.8 percent for hydraulic construction and 6 percent for other purposes.

Three new plants were near completion in Yunnan, Kwangsi and western Szechuan at the start of this year, while plans were under way for one modern plant in both Sikang

and Kweichow provinces. In June, 1941, the Kansu Provincial Government announced the organization of the Kansu Cement Works.

Build Pumice Mill

PACIFIC PUMICE MATERIALS CO., Stockton, Calif., will build a \$30,000 mill here to process pumice from a large deposit near Valley Springs. W. E. Schlink, president of the company, reports that the plant will be erected early this summer, and will be the fourth in the company's chain. The others are at Fresno, Pittsburg, and in Siskiyou County. Increasing use of pumice as an admixture in cement has led to a large demand. A shortage of bags has caused farmers to turn to a pumice-cement concrete silo for storage purposes. Some patented machinery has been developed for moulding circular concrete blocks to make the silos.

Expand Pipe Operations

THE THOMAS CONCRETE PIPE CO., Oklahoma City, Okla., operating several concrete pipe plants in Oklahoma and Texas, is opening its fifth plant in Kingsville, Texas. This plant will manufacture 12-in. to 54-in. pipe for runway and storm sewer drainage for an army airfield.

To Make Block

R. L. WEBB, St. Joseph, Mo., will open a block plant here in April which will have an initial production of 1000 per day. Mr. Webb has been in the building business since 1928.

Sand-Lime Brick Production and Shipments

EIGHT active sand-lime block and brick plants reported for February and eight for January, statistics for which were published in March.

AVERAGE PRICE FOR FEBRUARY

	Plant Price	Delivered Price
Detroit, Mich. ....	.....	.....
Sebewaing, Mich.	\$10.50	.....
Saginaw, Mich.	\$12.00	.....
Grand Rapids, Mich. ....	.....	15.00
Seattle, Wash.	16.50	18.50
Mishawaka, Ind.	12.50	.....
St. Louis, Mo. ....	.....	12.50
Watertown, Mass.	12.50	13.50

STATISTICS FOR JANUARY AND FEBRUARY

	January	February
Production	2,057,150	2,135,980
Shipments (rail)	270,000	295,000
Shipments (truck)	1,679,611	1,741,508
Stock on Hand	1,608,202	1,440,999
Unfilled Orders	1,230,000	880,000

*Eight plants reporting: incomplete, one not reporting stock on hand and two not reporting unfilled orders.

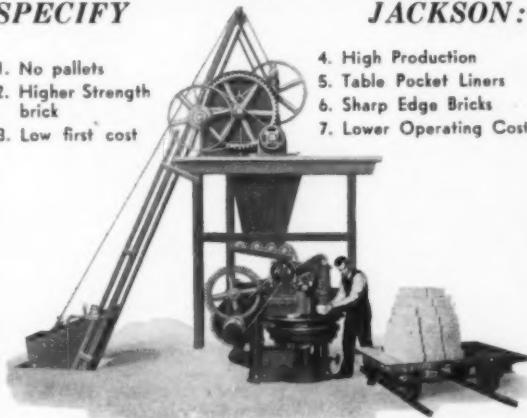
†Eight plants reporting: incomplete, two not reporting stock on hand and three not reporting unfilled orders.

ROCK PRODUCTS

1 JACKSON BRICK MACHINE = 1 COMPLETE EFFICIENT PLANT

Seven Reasons Why It Will Pay You To SPECIFY JACKSON:

- 1. No pallets
- 2. Higher Strength brick
- 3. Low first cost
- 4. High Production
- 5. Table Pocket Liners
- 6. Sharp Edge Bricks
- 7. Lower Operating Cost



No other Brick Machine can give you all these advantages. The JACKSON Model A produces up to 28,000 brick per day . . . the Model C up to 14,000 brick per day. Check up on this *low-cost* profit-making machine now. **WRITE FOR BULLETIN J-42 TODAY.**

JACKSON & CHURCH COMPANY
SAGINAW, MICHIGAN, U.S.A.

The "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

Hand or wet process. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe—any length.

Quinn Medium Duty Pipe Forms

For making pipe 12 to 60 inches in diameter—any length.

WRITE TODAY

Complete information, prices and estimates sent on request.

QUINN WIRE & IRON WORKS 1603 12th ST. BOONE, IA.

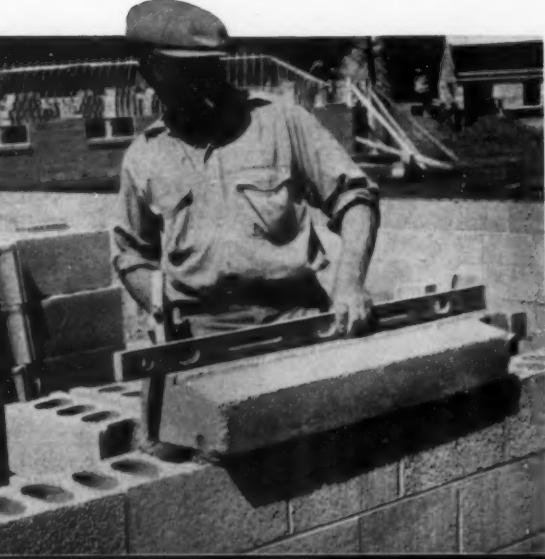
CONCRETE PRODUCTS Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

ROCK PRODUCTS

309 West Jackson Blvd.

Chicago, Ill.



**Thousands of needed
CONCRETE jobs
don't need
critical materials**

In and around war industry plants, war housing projects and military centers, thousands of improvements are needed that should have the firesafety, durability, upkeep-thrift and low yearly cost of CONCRETE.

In many other areas, concrete materials are available for modernization and improvement jobs that will build up home values, boost farm and factory production.

These jobs frequently require no critical materials.

And since concrete materials are for the most part local, concrete construction involves minimum use of freight cars and trucks needed for moving defense goods.

Concrete products men and concrete contractors can do their part today by showing industry executives, farmers and others how concrete construction will help get their production into high.

Defense housing and plant
jobs

Concrete masonry walls
Floors, foundations and
footings

Steps and walks

Porches and terraces

Storage yard driveways

Paved parking areas for
factories and stores

Team tracks, ramps, load-
ing platforms

Home driveways and
garages

Barn floors and many other
farm improvements

PORLAND CEMENT ASSOCIATION Dept. 4-45, 33 W. Grand Ave., Chicago, Ill.

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

BUY DEFENSE STAMPS AND BONDS... SUPPORT THE RED CROSS

Increasing Life of Wire Rope

Some helpful suggestions to promote longer life of wire rope revealed in recent editorial survey

ROCK PRODUCTS INDUSTRIES are among the largest users of wire rope. A recent editorial survey disclosed the following, probably incomplete, list of uses: Shovels, draglines, cranes, plant hoists, car pullers, guy lines, tow lines, anchor lines, pipe lines, derricks, traveling cranes, concrete mixers, elevators, vibrating screen suspensions, aerial tramways and slings.

Uses for Worn Rope

In answer to a question: "What uses do you find for worn rope that has been taken off your equipment?" we find operators use worn rope for: moving machinery, slings, tow cables, mooring lines, anchor lines, guy lines, tieing piling clumps, dragline hoist and dump lines, bridles on dragline buckets, etc.

Inspection: Lubrication

Some 75 percent of rock products operators follow a standard schedule for inspection and lubrication of their wire rope. Several state there is a daily inspection. One has "an engineer in charge of equipment." Even where a regular schedule of inspection and lubrication is not followed, operators feel that this is very important and being adequately taken care of.

Preventing Damage to New Rope

Precautions taken to prevent damage to new ropes when being installed on equipment include: Assurance that drums and sheaves are not worn into grooves; new cables not kinked and are properly lubricated; sheaves kept smooth and in alignment; drums lagged with oak lumber; unroll reel of new rope properly; use recommended methods for uncoiling rope; and seizing of the end before uncoiling; keep the rope clean and away from sand, mud and abrasive material which may damage rope.

Preformed Rope or Not?

Two-thirds of the operators questioned differentiate between preformed and regular lay type wire rope. About three-fourths of them use preformed wire rope.

In answer to questions as to the advantage of using preformed wire rope,

reasons were given as follows: Longer and better service on hoisting cables; preferred for counterweight because sheave diameters are small; lasts longer and stands handling much better; wires lie naturally in place, wires broken in wear seem to lie flat against the rope instead of wickering out, making the rope safer to handle; handles better, breaking in a new rope not so difficult, can be reversed without damage to rope; does not unravel when cut or broken; less apt to kink; more flexible and gives longer wear.

One operator reports little advantage in using preformed wire rope other than the fact that it does not ravel badly when cut or broken. His experience with it, however, has been confined principally to dragline hoists and digging lines on dragline buckets.

Prevention of Puncture Wounds in Handling

Just about half the operators replying to our questionnaire have had employees who suffered puncture wounds or lacerations from barbs on worn ropes, or the sharp ends of rope. Several, however, specify that such injuries were very minor in character. Several suggestions are given for avoiding such injuries, the most popular one being that men who handle wire rope be supplied with heavy leather-faced gloves and be compelled

to wear them when handling wire rope.

One operator cautions against the use of gloves or mittens with gauntlets, insisting that the leather-pad mittens used be loose fitting so as to slip off the hand readily if caught on a barb. This should keep a hand from being wound on the drum if a tight-fitting glove were used. Of course, the obvious answer to the prevention of such accidents is: "Don't use worn rope with barbs." As one operator points out this not only eliminates possible injuries, but insures against breaks that cause plant shutdowns. Another says he uses worn rope only for dredge anchor lines, where hands are not punctured.

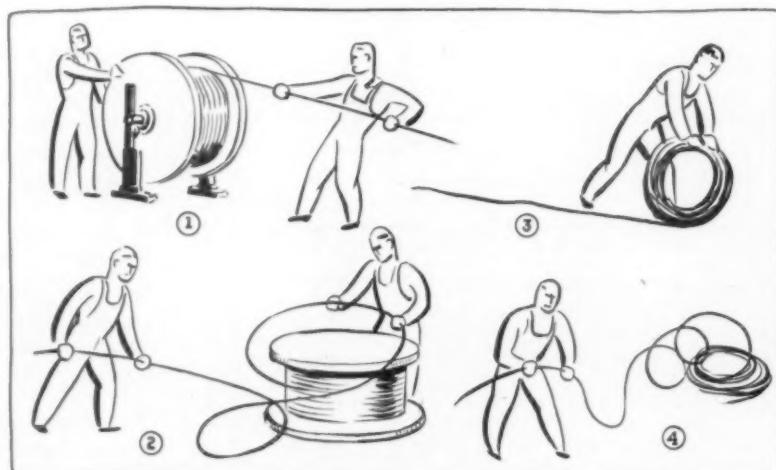
The following article, based on a much wider survey of all kinds of wire-rope users, cautions against the use of worn wire rope for slings, because of the accident hazard.

Plaster Chart

UNITED STATES GYPSUM Co., Chicago, Ill., has issued a comprehensive new reference chart which describes the uses and advantages of all types of interior plaster and contains a glossary of 112 plastering terms. Base coat plasters, prepared finishing plasters, job mixed finishing plasters, and limes and gauging for job mixed finishes are explained and described in great detail. The chart is available upon request.

Purchase Quarry

CLAUDE NEWMAN has purchased the Hecker quarry near Athens, Ill., from Oscar Dintelman of St. Libory. The new owner was formerly in the hauling business.



Proper methods of handling wire rope. 1. This is the way wire rope should be taken from a reel. 2. The wrong way to take wire rope from a reel. 3. The right way to uncoil wire rope. 4. Do not uncoil wire rope in this manner.

Where to (and where not to) Use Discarded Wire Rope

By F. L. SPANGLER

NOT LONG AGO the writer had occasion to circularize several thousand industrial engineers, and he took that opportunity to pose a couple of questions. One of those questions was: "To what use do you put discarded or retired wire rope?" The original intent of the question was to find logical ways and means for gaining extra service from a steel product which otherwise would have been sold for scrap. But the returns were both surprising and disconcerting.

Of the 916 replies received, more than 12 percent of them gave the startling statement that discarded wire rope was being pressed into service as slings. Although the writer has had considerable experience in various divisions of industry, this answer was amazing. . . . And alarming because no safety director in my acquaintance would condone the use of worn wire rope for sling use. It is too dangerous. Why? . . . because—

There are too many variables in worn wire rope to permit of its use as a sling. Of the 114 wires in a 6 x 19 wire rope, only 72 wires are visible. It is of course possible to count the number of broken crown wires in any given length of lay to determine the retirement stage of the rope—but such visual inspection does not reveal the number of broken inner-wires—the places where the core has dried out and collapsed, the spots in the rope that have been weakened by internal corrosion, or many other factors which might make the rope dangerous as a lifting or carrying medium for loads.

Worn and discarded wire rope, in the interest of steel conservation, maintained production, and economy of operation, can and should be put to other uses before sold for scrap.

For applications where rope breakage will not result in a hazard, such as drag cables on dragline excavators, tag lines on bucket cranes, trip cables on power shovels, and drag-scaper cables, discarded rope is not out of place, provided it is of the correct diameter to fit the sheaves, and its construction provides the desired flexibility.

Discarded rope is also serviceable for use as temporary guys, as tow

ropes and pull ropes, as guard ropes and fencing, for lashing and binding, and like purposes. Where the rope has to be handled often, rope of the pre-formed type is less apt to injure the hands since broken wires are not inclined to stick out from preformed rope, whereas with non-preformed rope the ends of broken crown wires create jaggers, which sometimes puncture or lacerate the hands and wrists of those handling the ropes.

Ropes that are discarded because of abrasion, fatigue, or corrosion may be used for the purposes listed above, but they should be avoided for slings. Even where wear has occurred only along a limited length of the rope, grave chances are taken in using what appears to be a good section of the rope as sling material.

[This is an introduction to a series of articles involving some very practical suggestions for increasing life of wire rope.—THE EDITORS.]

New Uses for Mica

OF NATIONAL-DEFENSE INTEREST is the possibility that pulverized mica (in this case a sericite by-product of a South Carolina gold mine) can be used to replace a substantial part of the zinc oxide used in rubber. It has already demonstrated its value as a cable insulation, not alone as a filler but as an activator and accelerator, and it is being tested in tire manufacture which dissipates 60,000 tons or more of zinc oxide annually. This new product, which requires only light disintegration to produce a minus 325-mesh product, is used

mainly for casein paint. Although selling for less than half the price, it is claimed to be better than ordinary water-ground mica in varnishes and certain other protective coatings because it lacks sheen while retaining the fish-scale form, which is one of the superior properties of wet-ground as compared with dry-ground muscovite. On the other hand, sericite is valueless for wall-paper decoration. Consideration is being given to using this and other kinds of ground mica for foundry facings, parting base, or washes, alone or combined with graphite coatings. It is claimed that ground mica and also vermiculite used as an extender for aluminum bronze powder produces a better priming paint at a saving of 50 percent or more of aluminum. Micronized mica is being produced under exclusive franchise by a North Carolina company and yields products so finely divided as to be marketed as 100 percent passing the equivalent of 3,000-mesh. This material is used in paint and plastics, and biotite similarly ground is employed in lubricating greases, leather finishes, etc.

Rebuild Plant

THE R. E. JAMES GRAVEL CO., Austin, Texas, rebuilt their plant here, using all-steel construction. New equipment includes a 3- x 10-ft. Cedar Rapids vibrating screen, an 18- x 32-in. Acme Wire & Iron Works rotary screen, a 1-cu. yd. D. L. Koehring dragline, a 4-in. American-Marsh pump, and a 4-in. sand pump, all electrically-operated. This firm has a contract to supply 100,000 cu. yd. of sand and gravel for the construction of Camp Swift, now being built at Bastrop, Texas, where the company has set up two plants. One has a capacity of 125 cu. yd. per hour and the other, 60 cu. yd. per hour. The main plant at Austin has a capacity of 125 cu. yd. per hour.



Modernized sand and gravel plant of The R. E. James Gravel Co.

Build Gravel Plant

EDWIN D. NEELEY, Waco, Texas, has erected a new sand and gravel plant this past year. Mr. Neely has been in the business at this location since 1922. The new plant, built by Brown- ing Ferris Machinery Co., includes in its equipment a new 18- x 100-in. Cedar Rapids rotary screen and a $\frac{1}{2}$ -cu. yd. Bay City dragline. Fourteen International and Ford trucks equipped with 3 and 4-cu. yd. Dempster Dumpster bodies are operated. The plant has a capacity of 35 tons per hour.

Medusa Steps Up Production

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, in the report of President J. B. John announces that production in the company's plants last year was 65.4 percent of capacity as compared with 50.6 percent in 1940.

Open Gravel Pit

THE CONCRETE MATERIALS CO., Waterloo, Iowa, has completed construction of a new sand and gravel plant for the Chicago Great Western Railroad at Byron, Ill. Harold Scott will be manager of the plant. The property was purchased by the railroad last fall from Harry Jackson and Ethel Spalding.

Increase Car Weights

H. S. Wood, of the Obion County Bureau of Supply, Union City, Tenn., has advised users of agricultural limestone that new regulations have been received to the effect that minimum weights of freight cars for limestone have been increased from 72,000 lb. to 90,000 lb. This regulation is in keeping with the government ruling that no open-top car shipments may be made with less than the higher weight due to a threatened car shortage.

Crushed Stone for Runways

G. G. HILL & CO., Dexter, Mo., has a sub-contract from R. B. Potashnik and Regenhardt Construction Co., Cape Girardeau, Mo., to furnish 150,000 tons of crushed stone for the runways of the new Vichy airport. These are to be water-bound macadam base courses 2550 ft. long and 150 ft. wide. A crushing plant has been set up about a mile from the airport. Equipment includes a Cedar Rapids 2540 crusher with a plate feeder. From the crusher, the material is elevated to a 3- x 10-ft. scalping screen, from which it passes to a 1036 secondary crusher and finally



to a No. 3 Kubit crusher. Equipment was purchased from E. F. Marsh Co., St. Louis, Mo., distributor for Iowa Manufacturing Co.

Build Cold Mix Plant

THE SERVTEX MATERIAL CO., New Braunfels, Texas, recently completed a new plant for the production of cold mix asphaltic concrete. The new pugmill has a capacity of 2500 lb. per batch at the rate of one batch per minute. Equipment includes a 15-ft. Simplicity dryer and cooler unit which is fired with natural gas, a 130-ft. revolving screen, a triple-deck Allis-Chalmers screen, two Aerovib screens, one Niagara, and two Hummer screens.

In the illustration may be seen the new cold mix plant to the left, and the crushed stone plant to the right. An unusual arrangement to handle

aggregates for the cold mix plant is shown. A ramp has been built up to the level with the top of low steel hopper bins so that trucks may dump conveniently without going up a steep grade. The four steel bins are located over a reclaiming belt conveyor which handles the mixed aggregates to the hopper of a bucket elevator that carries the aggregates to the drying and mixing unit.

Build Noiseless Plant

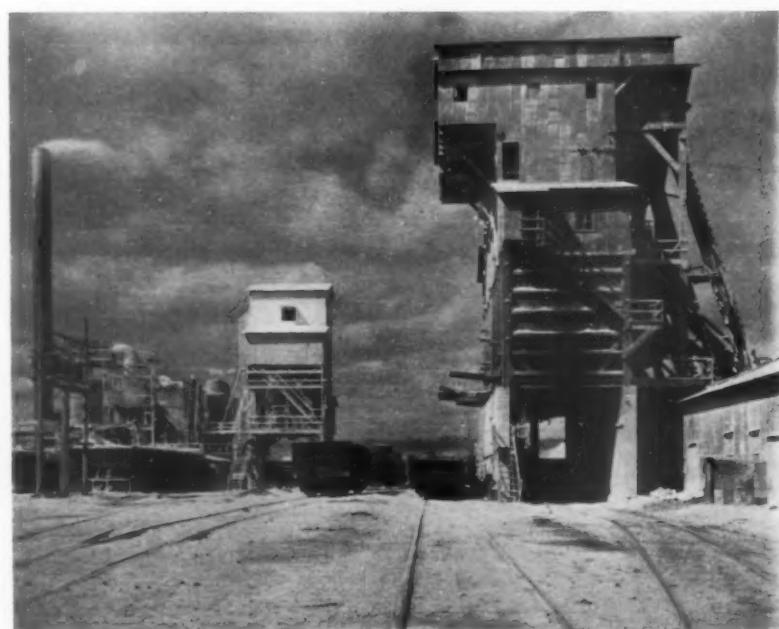
OIL CITY SAND AND GRAVEL CO., Franklin, Penn., recently won an appeal to continue operations after it had promised to erect a new plant of concrete block to house boilers and power equipment and place stokers on its dredge. Hoppers also have been enclosed.

Reopen San Juan Mill

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., reopened its San Juan plant which had been closed down since December. The cement plant was closed to make repairs for an increase in production. Three of the four kilns will be in operation.

New Florida Quarry

WILLISTON SHELL ROCK CO. has opened a new quarry at Wade, Fla., about eight miles north of Newberry. James H. Craggs is president; H. M. Craggs, vice-president; and T. E. Cleary, secretary-treasurer, who is in charge of operations.



Showing new cold mix asphaltic concrete plant of The Servtex Material Co. to the left, and crushed stone plant to the right.

TDA EXPERIENCE

POINTS A WAY FOR

ROCK PRODUCTS MANUFACTURERS

to get more production from present grinding equipment

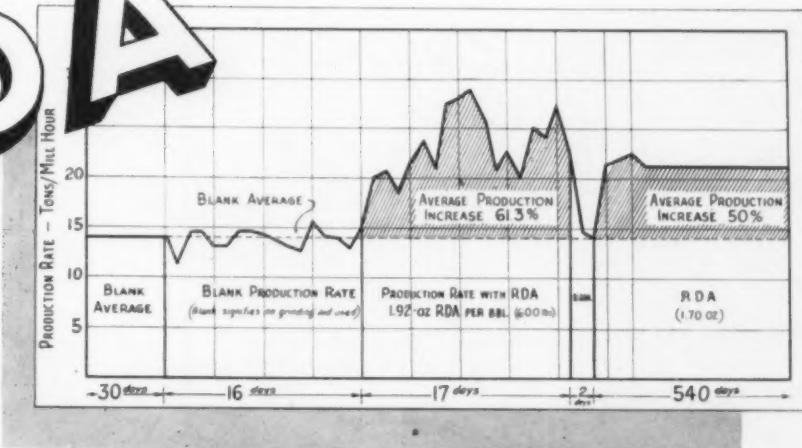
with

RDA

RDA is a companion product of TDA—the catalyst-dispersing agent—grinding aid now being extensively used in the Portland Cement Industry. It was developed to meet the needs of grinders of rock products when the catalytic agent of TDA is not required. And in times like the present when production is vital and the need to conserve power urgent, the grinding efficiency effected by RDA suggests new uses for it in fields we do not now serve.

We don't claim that the dispersing agent—RDA when used as a grinding aid for Rock Products will increase production with every material. We haven't had the chance or the time to do it. But, we do claim that RDA is being used successfully in many cement mills for grinding raw materials and showing production increases of from 15% to 90%. Maybe RDA won't do this for your product, but isn't it worth a trial?

Here's what one mill is getting with RDA grinding cement rock. From the above chart note the marked increase in grinding mill production rate immediately upon adding RDA. Likewise note the abrupt decrease when the RDA addition was stopped. Here was an increase of production rate of 50% obtained by using only 1.70 ounces of RDA solids per 600 pounds of raw material. (Current price of RDA in liquid form is



Results of Plant Run in a Western Cement Mill

3½c/lb. f.o.b. Chicago.)

In addition, the use of RDA by cement manufacturers has given other advantages which of themselves may be valuable to your product.

1. Permits balanced plant operation.
2. More uniform particle size free from extreme fines or oversize particles.
3. Improves air separator efficiency.
4. More uniform kiln feed. Five to eight percent increase in kiln production.
5. Reduces stack losses due to lack of extreme fines.
6. Finished clinker easier to grind.

Based on what RDA is already doing for the raw grinding of cement mills we believe it has utility for the grinding of lime, limestone, feldspar, talc and other rock products. Since it takes no expensive equipment to try RDA, isn't it worth investigating today when production is so important.

TRY RDA FOR GRINDING
LIMESTONE
FELDSPAR
LIME
TALC



DEWEY AND ALMY CHEMICAL COMPANY
CAMBRIDGE CHICAGO OAKLAND

Large Cement Contract

SUPERIOR PORTLAND CEMENT Co., Seattle, Wash., has been awarded a \$191,628 contract by the Reclamation Bureau to furnish 90,000 bbl. of cement for Grand Coulee Dam.

New Canadian Plant

WARTIME METALS CORPORATION, a Canadian Government enterprise, to make magnesium by the Pidgeon ferro-silicon process is to be built in Quebec province. It will be operated by Dominion Magnesium, Ltd.

and is designed for 10 tons of magnesium per day, to be increased to 20 tons. The process uses dolomite lime, as ore (see *ROCK PRODUCTS*, March issue, p. 61).

Directors of Wartime Metals Limited are: President, Jules R. Timmins of Montreal, president of Hollinger Consolidated Gold Mines, Ltd.; J. H. C. Waite of Toronto, president of Mining Corporation of Canada Limited; R. E. Stavert of Montreal, vice-president of Consolidated Mining and Smelting Company of Canada Limited; James G. Ross of Thetford

Mines, Quebec, manager of Asbestos Corp. Ltd.; J. E. Perrault of Athabasca, Quebec, director of Noranda Mines Limited, and formerly provincial minister of mines in Quebec.

Expand Defense Housing

FEDERAL HOUSING ADMINISTRATION reports that applications for FHA mortgage insurance on new homes received during February numbered 29,547, a gain of 65 percent over January and 72 percent over February of last year. The amount involved was \$125,283,395. Practically all the new homes are being built in war industry areas.

Increases Phosphate Holdings

INTERNATIONAL AGRICULTURAL CORP., New York, N. Y., has acquired about 3000 acres of phosphate land in Hickman county, Tenn., from the Meridian Fertilizer Co. for a reported consideration of \$65,000. It is presumed that brown rock sands will be excavated and trucked to the producing plants at Mt. Pleasant and Wales.

Workers Insured

MONSON MAINE SLATE CO., Monson, Maine, has contracted for employees group insurance with the Metropolitan Life Insurance Co., according to Fred W. Crane, treasurer of the slate company. The group plan was underwritten on a cooperative basis whereby the employees contribute fixed amounts and the employer bears the balance of the entire net cost. Under the plan, employees receive \$1000 life insurance and in case of sickness or non-occupational injury will be paid from \$10.50 to \$20 a week.

Move and Modernize

THE C. W. ROBERTS SAND & GRAVEL Co., Dallas, Texas, reports that their plant has been moved to a new location about eight miles northwest of Dallas on the Elm Fork of the Trinity river. The old plant equipment was rebuilt, and a new Pioneer vibrating screen was installed.

Reopen Old Quarry

RAY & SON, Louisiana, Mo., has made preparations to open a quarry near here to supply crushed stone aggregate for a defense plant. The quarry has not been operated for half a century. This quarry is on what is known as "cement land" owned by Bruce & Cook. It was at one time used by the government to obtain jetty stone and rip-rap for river improvement work.

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To save the time involved in writing individual letters for this new literature, you may obtain them by merely checking and mailing the coupon on the next page.

1 **BALL MILLS.**—Straub Mfg. Co. has published new bulletins No. 37 and No. 43 which describe and illustrate their ribbon ball mills.

2 **BALL MILL LINERS.**—American Manganese Steel Division has issued Bulletin No. 1141-L on the question of the most suitable metal for ball mill liners which should prove of interest to owners and suppliers of ball mills regardless of the ore they are reducing or what type mill or liners they employ.

3 **BLOCK MACHINE.**—W. E. Dunn Manufacturing Co. has issued a new catalog describing and illustrating the Korpak block machine which combines five all-important features—instantaneous feeding 5000 Korpaks per unit, full internal packing, complete uniformity in finished units through troweling device, and complete stripper action.

4 **CONCENTRATING TABLES.**—Deister Machine Co.'s new Bulletin No. 28 describes and illustrates Plat-O ore concentrating tables. Diagrammatic setting drawings in detail for either right or left-hand tables are also shown.

5 **CONCRETE MIXERS.**—The T. L. Smith Co. has released a well illustrated catalog No. 198-B, describing the Smith-Mobile truckmixer and agitator, ranging from 2-cu. yd. to 4½-cu. yd. capacity.

6 **COMPRESSORS.**—Fuller Co. has issued a new bulletin, C-5, illustrating and describing rotary compressors and vacuum pumps.

7 **CONVEYORS.**—Chain Belt Co. has released a new catalog, Bulletin No. 410, containing information and pictorial descriptions of Rex belt conveyors, apron conveyors and bucket elevators.

8 **CONVEYORS.**—The Jeffrey Mfg. Co. 15-page Catalog No. 758 contains descriptions, illustrations and specifications of different types of portable belt conveyors.

9 **CRANE.**—Link-Belt Speeder Corp.'s new 8-page book No. 1929 contains descriptions and illustrations of the LS-60 heavy-duty ½-yd. crawler shovel, dragline, crane. Its simplicity, reserve power, easier handling, and all welded construction, are features stressed. Illustrations show the machine at work and how it is built.

10 **CRANE.**—The Osgood Co. has issued Catalog No. 4128 describing and illustrating various parts of Type 20, Model 205WM; Type 70, Model 705WM; and Type 80, Model 805WM Mobilcranes which can travel over dirt roads, yards, wharves, concrete floors, without damage to machine or road damage.

11 **CRANE ON WHEELS.**—Six Wheels, Inc., has issued Bulletin CU-142 which describes the advantages of the Maxi one-man crane under-carriage. These units are obtainable in capacities of from 5 to 40 tons and operate at speeds up to 17.5 m.p.h. The four-page bulletin shows various industrial applications, including the quick handling of aggregates.

12 **CRUSHER.**—Iowa Mfg. Co. new single page bulletin No. SCO-1 describes and illustrates two types of sized stone plant to be used with either vibrating or revolving screen. A diagram illustrates method of setting up the plant and gives complete specifications.

13 **CRUSHERS.**—McNally Pittsburg Mfg. Corp. new Bulletin No. 941 gives the latest information on stoker coal crushers of all types. The latest design improvement is the new ratchet take-up which will adjust the crushing rolls while the crusher is in operation.

14 **CRUSHERS.**—Straub Manufacturing Co. has issued Bulletins No. 39 and No. 601, describing and illustrating the new Kue-Ken crushers which crush without rubbing and may be mounted on trucks, tall bins, head frames, etc. A pressure switch automatically stops the crusher if lubrication is insufficient.

15 **DIESELS.**—General Electric Co. has published a bulletin, GEA-3666, describing and illustrating Diesel engines for industrial switching. They have standardized the construction of the 45-ton size which is easy to operate, inspect and maintain, and can be used for any switching service now handled by a steam locomotive of comparable size.

16 **DRILLS.**—Independent Pneumatic Tool Co. has issued a 64-page Catalog No. 37, giving complete descriptions, specifications and prices on the entire Thor line of electric drills, drill stands, screw drivers, nut setters, tappers, saws, hammers, nibblers, grinders, etc. It is printed in two colors and profusely illustrated with photographs of tools in operation on various types of work.

17 **DRIVES.**—J. E. Rhoads & Sons has issued information in regard to its Tannate-Rockwood pivoted motor base drives which can be used with large or small motors, to drive horizontally, vertically or hang upside down, and can be used with individual or group drives.

18 **DUST COLLECTOR.**—American Foundry Equipment Co. has published a 58-page completely revised catalog, No. 72, describing its "Dustube" dust collectors, both knock-down and assembled types. A complete engineering manual section is included which gives practical essential data for efficient operation of a dust control system, technical layouts and engineering tables and charts especially useful in planning applications of dust control units.

19 **DUST COLLECTORS.**—Western Precipitation Corp. has released a bulletin on the Multicleone dust collector which is described as making use of centrifugal force for separating dust from a gas stream; also Bulletin D-2 describing and illustrating Turbulaire spray dryers which will handle any liquid that is in a pumpable condition whether it be a colloidal suspension, a true solution, or a thin slurry, and provides a convenient solution for many waste disposal problems. Also a bulletin has been issued on the Cottrell electrical precipitator for secondary and fine cleaning of blast furnace gas, converting it into clean fuel for soaking pits, open hearth furnaces, under-fired coke ovens, boilers and gas engines.

20 **EXCAVATOR.**—Keystone Driller Co. has released Bulletin H-142 describing and illustrating Model 18-A one-yard revolving skimmer-hoe-crane excavator. The bulletin also gives specifications and clearances of the crane, trench hoe, and skimmer.

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21 **FEEDERS.**—The Jeffrey Manufacturing Co. has released a new 20-page catalog No. 765, illustrating and describing feeders, conveyors, elevators, processing equipment, screens, crushers, pulverizers and shredders, packers, chains and sprockets, power transmission machinery, bin valves, and portable units.

22 **FLOODLIGHTS.**—Lister - Blackstone, Inc. has announced a new handy, portable floodlight unit easily towed by an auto or small truck, built to give light "where you want it—when you want it." It fills the need where power lines are unavailable or where the connection and set-up would be too expensive.

23 **HANGERS.**—The Thompson Electric Co. new Catalog No. 41 describes and illustrates various models and installations of their disconnecting and lowering hangers; shock absorbers; suspension devices and accessories; special appliances; chain; chain and cable fittings, and wire cable for lighting fixtures.

24 **IMPACT BREAKER.**—Iowa Manufacturing Co. has issued Bulletin No. K-2 describing and illustrating its "Kubit" impact breaker, giving many construction features and operating advantages.

25 **JAW CRUSHER.**—Traylor Engineering & Manufacturing Co.'s new bulletin No. 2105, superseding No. 1105, contains a table of capacities, list of parts, approximate setting dimensions, and other interesting information on their Type H Blake jaw crusher. Bulletin No. 1113, superseding No. 113, contains the same information on their multi-stage fine reduction crusher.

26 **KILNS.**—Kennedy-Van Saun Mfg. & Engr. Corp. new 16-page Bulletin No. 770 describes and illustrates rotary kilns for cement, lime, dolomite, roasting and sintering ores, drying and preheating. It contains the latest contributions to rotary kiln design and also covers merits of patented auxiliary equipment.

27 **LUBRICATION.**—The Farval Corp. has issued an 8-page bulletin, Form No. 187, in three colors, which describes in minute detail its centralized system of lubrication, illustrates its component parts, and charts the 12 distinct savings effected. A series of cross-sections show the progressive movements within the measuring valve as it delivers oil or grease under pressure to each individual bearing.

28 **METERS.**—Interstate Sales Co. has issued a new 6-page folder on the Wolfe Angle Meter and the Wolfe Circle Meter, containing technical and educational matter that should prove of great interest to engineers, draftsmen, welders and sheet metal workers. The object of the angle meter is to enable the "man on the job" to lay out directly on pipe, or flat material, any angle bend from 0° to 90°.

29 **PUMPS.**—Denver Equipment Co.'s new two-sheet Bulletin No. P6-B illustrates and describes adjustable stroke diaphragm pumps, lowhead diaphragm, and vertical sand pumps. The bulletin also contains some interesting cross-section diagrams of the pumps.

30 **PYROMETER.**—The Bristol Co. has developed a new line of Diesel engine pyrometers designed especially for battleships, submarines, destroyers, cruisers, sub-chasers, mine sweepers and seaplane-tenders.

31 **RESPIRATOR.**—Mine Safety Appliances Co. new bulletin No. CM-5 describes the new and improved M.S.A. single filter dustface respirator. Featured improvement is the new single filter which is all in one piece and gives protection against an even broader range of dusts and mists. It can be completely disassembled without tools in a few seconds; every part is interchangeable, and, except for the filters, can be washed and sterilized.

32 **ROLLER MILL.**—The Williams Patent Crusher & Pulverizer Co.'s Bulletin No. 580 describes and illustrates its improved roller mill with spinner type air separator, collector, fan and auxiliary cloth collector arranged for simultaneous drying and grinding.

33 **RUBBER.**—The B. F. Goodrich Co. has published an 8-page catalog section, No. 8000, which features four tables of pertinent data on its Ameripol D synthetic rubber, used in making mechanical rubber products. The folder is plentifully illustrated and discusses in detail its properties, hardness, tensile strength, elongation, weight, color, odor, taste, etc.

34 **SCREENS.**—Robins Conveying Belt Co.'s new bulletin No. 118 is an attractive bulletin containing information and illustrations on the new Vibrex screen and contains a list of different materials the screen handles.

35 **SCREENING PLANT.**—Iowa Mfg. Co. new portable horizontal screening plant is well illustrated and described in a two-color single sheet bulletin No. SCR-1 just issued. The many special features of this plant are clearly shown in the bulletin and specifications of the plant are listed.

36 **SOIL-CEMENT EQUIPMENT.**—Allis-Chalmers has published a 28-page catalog, Form No. MS 802, describing and illustrating a complete line of soil-cement equipment such as tractors, graders, discs, harrows, sub-graders, mixers, water distributors, rollers and other equipment. Complete mechanical specifications are also provided. The book is designed to acquaint those inexperienced in this type of construction with the necessary equipment.

37 **SPEED REDUCERS.**—The Cleveland Worm & Gear Co. new 8-page booklet, Form No. 150, entitled "Background" emphasizes their claim for long-range, economical operation of speed reducers by quoting a series of letters from manufacturers in various leading industries who began purchasing their drives 15 to 20 years ago. A final chapter, "Foreground," carries the message into future years of industrial progress.

38 **STEEL SHAPES.**—The Commercial Shearing & Stamping Co. has issued a booklet, Section No. 3, comprising drawings and data on standard steel shapes which can be purchased without die or tool charges.

39 **WASHERS.**—Smith Engineering Works has issued Bulletin No. 266M, describing and illustrating machinery for mine, quarry and gravel pit, including primary breakers, crushers, pulsators, dry screens, washing screens, scrubbers, sand classifiers, sand tanks, sand drags, feeders, belt elevators, chain elevators, bin gates, mounted and semi-portable crushing plants. The bulletin also contains specifications of all equipment, and quarry plant and gravel plant questionnaires.

40 **WELDING.**—American Manganese Steel Division of The American Brake Shoe & Foundry Co. has released Bulletin No. 941-W illustrating and describing various types of welding products for reclamation, hard surfacing and repairing of ferrous equipment parts.

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FINANCIAL NOTES

RECENT DIVIDENDS

Arundel Corp.25	April 1
Basic Refractories, Inc. com. (pl)10	Mar. 16
Bessemer Limestone & Cem. Co. ....	.25	April 1
Calaveras Cement Co. 7% pfd. (p100) (arrears) ..	.75	Mar. 16
Ideal Cement Co. ....	.35	Mar. 31
Industrial Silica Corp. 6 1/2% pfd. (100) (ar- rears)	1.62 1/2	Mar. 10
Kelley Island Lime & Transport Co. ....	.25	Mar. 31
Lawrence Portland Cem. Co. cap. (np) ....	.25	Mar. 10
Lone Star Cement Corp. ....	.75	Mar. 31
Michigan Silica Co. ....	.05	Mar. 23
Pacific Coast Aggregates, Inc. com. (p10) ....	.03	Mar. 20
Pennsylvania Glass Sand Corp. ....	.25	April 1
*Southern Phosphate Corp. ....	.15	Mar. 31
Superior Portland Cem- ment, Inc. \$3.30 Cl-A part ....	.82 1/2	April 1
U. S. Gypsum Co. ....	.50	April 1
U. S. Gypsum Co., pfd.	1.75	April 1
Yosemite Portland Cem. Corp. 4% pfd. (p10) ....	.10	April 1

*Paid like amount March 28, 1941.

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, reported a profit for the year of 1941 of \$642,323, or \$3.53 a share, after federal income tax allowance, as compared with a profit of \$661,525, or \$3.63 a share for 1940. Dividends of \$2.25 a share were paid on common stock and six percent on preferred, which was reduced during the year from 2896 shares to 2805 shares. Sales in 1941 reached \$7,675,000 and the profit before federal income tax allowance was made was \$998,480.

THE NEW ENGLAND LIME CO., Adams, Mass., which is to build a magnesium plant for the government at Canaan, Conn., has been allowed to qualify for sale in Massachusetts \$576,800 of debentures due in 1966. Debentures will carry a fixed interest from January 1, 1942, at the rate of three percent and in addition the company agrees to disburse additional interest payable out of net income at the rate of three percent annually. Additional interest is noncumulative. The company is offering the bonds to holders of its outstanding preferred stock in the ratio of \$50 principal amount of debentures for each share of no-par preferred stock. The plan has been approved by the stockholders.

ARUNDEL CORPORATION, Baltimore, Md., showed a net profit of \$950,435 for the year ended December 31, 1941, after all charges, which compares with \$859,515 in 1940.

LONGHORN PORTLAND CEMENT CO., San Antonio, Texas, reported a net income of \$674,217, after federal income taxes of \$351,927, for the year ended December 31, 1941. The comparative figure for 1940 was \$561,656.

DIAMOND PORTLAND CEMENT CO., Middlebranch, Ohio, had a net income of \$93,098, after taxes and charges, for the year ended December 31, 1941, as compared with \$108,184 in 1940. Although gross profit was larger in 1941 than in 1940, higher costs and taxes reduced the net income in 1941.

MISSOURI PORTLAND CEMENT CO., St. Louis, Mo., presented the following income account for the years ended December 31:

	1941	1940
Net Sales	\$5,155,540	\$3,598,548
Cost of Sales	3,190,134	2,113,479
Sell., etc., exp.	635,445	563,045
Oth. deducts., net.	11,528	9,173
Deprec. & depict.	398,949	390,792
Operating profit	919,484	522,059
Income taxes	206,211 ¹	124,631
Net income	623,273	397,428
Dividends	423,600	353,008
Surplus for year	199,664	44,420
Earn. surp., 1-1....	782,982	1,180,562
Idle plant adjust. ....	.....	450,000
Inc. tax adjust. ....	.....	cr 8,000
Earn. surp., 12-31....	982,647	782,982
Earned per share	\$2.20	\$1.41
No. of shares	282,406	282,406

¹No provision necessary for excess profits tax.

PENNSYLVANIA GLASS SAND CORPORATION, Lewistown, Penn., reported net income of \$722,694 for the twelve months ended October 31, 1941, compared with \$806,837 for the same period in 1940. Net income was lower in spite of the fact that sales were much higher than the \$2,922,401 reported in 1940, reflecting heavy increases in taxes and higher costs. Reduced demands for silica in the manufacture of glass from the automobile industry will be compensated in the increased requirements for the production of glass containers.

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., had a net income of \$43,191 for the year ended December 31, 1941, as compared with \$55,535 for a similar period in 1940. Net sales in 1941 were \$1,486,493 as against \$1,161,299 in 1940.

GYPSUM, LIME AND ALABASTINE OF CANADA, LTD., Toronto, Ont., had a net income of \$233,318 for the year ended November 30, 1941, as against \$208,042 in the previous year.

CORONET PHOSPHATE CO., New York, N. Y., reported a net income of \$191,456 for the year ended December 31, 1941, as compared with a net income of \$11,784 for a like period in 1940.

PETOSKEY PORTLAND CEMENT CO., Petoskey, Mich., reported income for the years ended December 31, as follows:

	1941	1940
Net sales	\$2,019,640	\$1,963,745
Cost of sales	1,317,278	1,239,704
Selling, etc., expense	417,383	392,962
Operating profit	284,978	331,079
Other income	18,899	16,056
Total income	303,877	347,135
Interest	12,815	18,703
Other deductions	1,823	1,806
Income taxes	87,161	64,196
Excess prof. tax	9,775	3,500
Net profit	192,304	258,929
Dividends (cash)	75,000	60,000
Surplus for year	117,304	198,929
Earn. surp., 1-1....	973,483	774,554
Stock dividends	500,000	.....
Earn. surp., 12-31....	590,787	973,483
Earned per share	\$0.77	\$1.30
No. of shares	249,295	199,295

¹After depreciation and depletion: 1941, \$119,622; 1940, \$119,557.

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., had a net income of \$286,849 for the year ended December 31, 1941, after all charges, as against \$105,169 for a like period in 1940, and a loss of \$28,060 in 1939. Sales in 1941 totalled \$3,384,413 as compared with \$1,936,802 in 1940.

NATIONAL GYPSUM CO., Buffalo, N. Y., had a net profit of \$1,533,815 for the year ended December 31, 1941, after charges, state and federal income and excess profits taxes which compares with \$1,565,196 for a similar period in 1940.

LONE STAR CEMENT CORPORATION, New York, N. Y., reported the following consolidated income account for the years ended December 31:

	1941	1940
Sales	\$30,782,097	\$22,674,274
Manufacturing, etc., costs	16,544,637	12,063,718
Selling expense, etc.	3,046,267	2,904,203
Depreciation & depletion	2,460,775	2,605,188
Operating profit	8,730,418	5,101,185
Total income	9,166,959	5,382,556
Fed. taxes, etc.	4,297,761	1,606,216
Misc. charges	787,446	319,046
Net profit	4,081,753	3,457,293
Earned per share	\$4.30	\$3.57
No. of shares	948,597	968,765

¹Includes provisions for doubtful accounts and contingencies.

²Includes \$3,529,342 (1940, \$1,015,000) estimated Federal income and excess profits taxes.

RIVERSIDE CEMENT CO., Los Angeles, Calif., had a net profit of \$747,313 after all charges for the year ended December 31, 1941, which compares with \$430,481 for the year 1940. Provision for federal taxes for 1941 amounted to \$470,000 as compared with \$54,400 for the previous year.

NORTH AMERICAN CEMENT CORPORATION, New York, N. Y., reported a net profit of \$104,026 for the year ended December 31, 1941, after depreciation, depletion, interest and federal taxes. This compares with a net loss of \$327,094 in 1940. Profit arising from the purchase of bonds at less than their principal amounts in 1941, amounting to \$85,310 was credited to surplus which compares with a similar credit of \$192,738 in 1940.

AMERICAN AGGREGATES CORPORATION, Greenville, Ohio, has presented the following consolidated income account for the years ended December 31:

	1941	1940
Net sales	\$2,589,433	\$1,583,039
Cost of sales	1,573,142	995,274
Selling, etc., expense	219,420	171,642
Deprec. & deplet.	222,634	183,287
Operating profit	574,237	232,836
Allied oper. inc.	132,680	46,635
Other income	118,874	63,523
Total income	825,800	342,993
Interest	14,079	12,583
Loss, assets sold	4,796	32,972
Fed. income tax	493,137	96,473
Net income	313,788	200,965
Preferred divs.	57,750	43,313
Common divs.	.....	56,288
Surplus for year	256,038	101,364
Earn., pfd. share	\$27.17	\$17.40
Earn., com. share	1.36	0.76
No. of pfd. shares	11,550	11,550
No. of com. shares	187,626	187,626

MONOLITH PORTLAND CEMENT CO., Los Angeles, Calif., had a net profit of \$235,022, after all charges, for the period ended December 31, 1941. This compares with a net loss of \$10,373 in 1940.

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, reported a net income of \$199,998 for the year ended December 31, 1941, as compared with \$179,590 for 1940. Net sales in 1941 were \$1,744,471 as against \$1,721,324 in 1940.

DOLESE & SHEPARD CO., Chicago, Ill., showed a net profit of \$29,431 for 1941, after depreciation. President W. R. Carney advised stockholders in his annual report that the volume of crushed stone production increased 61,000 cu. yd., or 22 percent, in 1941 over the sales for the preceding year. While sales volume was greater, he said, the results of quarry operations were not satisfactory because of a decline in the net average selling price per cubic yard in the Chicago area.

SCHUMACHER WALL BOARD CO., Los Angeles, Calif., announced a net profit of \$73,419, after all charges, for the three months ended January 31, 1942. This compares with a net profit of \$78,732 for the preceding quarter, and with \$74,778 for a similar quarter in 1941.

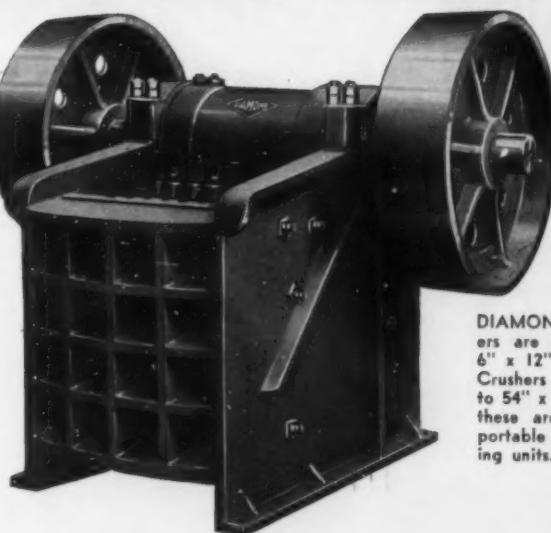
WOLVERINE PORTLAND CEMENT CO., Coldwater, Mich., reported a net profit of \$40,112 for the year ended December 31, 1941, as compared to \$62,478 for the calendar year 1940.

Net sales in 1941 were \$770,109 as against \$645,686 in 1940.

BLUE DIAMOND CORPORATION, Los Angeles, Calif., had a net income of \$413,271 after charges, for the year ended December 31, 1941, which compares with \$243,285 for a like period in 1940. Sales in 1941 were \$5,384,598 as against \$4,347,485 in 1940.

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., reports that net income for 1941 is estimated at over \$500,000 as against \$189,572 in 1940.

When You Buy a Crusher What Should You REALLY Buy?



DIAMOND Standard Jaw Crushers are made in 13 sizes from 6" x 12" to 24" x 36" and Roll Crushers in 6 sizes from 16" x 16" to 54" x 24", and various sizes of these are used in stationary or portable quarry plants and crushing units.

These are the things you should look for and expect in the crusher you buy:

1. A base heavy, rugged and properly reinforced to withstand the hardest crushing operations.
2. Pitman and plates (or rolls) carefully made of suitably hard material to give long and satisfactory use.
3. Proper balance for easiest running and consequent economy of power.
4. Delivery of full capacity.
5. Construction primarily based on the hardest type of crushing.

Don't buy on claims unless those claims can be thoroughly backed by performance records. And speaking of records, DIAMOND has some recent and very outstanding ones we're anxious to talk about. Either we, or any of our dealers will tell you all about it. In fact, we'd like to consult with you on any crushing, screening, conveying or elevating problem you have.

WRITE US or contact our nearest dealer for full details of DIAMOND ROCK, SAND AND GRAVEL EQUIPMENT. Free bulletins on request.



New Lime Kiln

THE ELLERNAN CO., Salt Lake City, Utah, has been organized to manufacture and sell the Ellernan calciner, or lime kiln, described in ROCK PRODUCTS, December, 1941, pp. 53-55, as a "revolutionary type" of continuous process kiln. The officers of the company are the engineers and inventors of the kiln, T. R. Ellerbeck, president, and W. E. Heffernan, vice-president. Mr. Ellerbeck, incidentally, is a nephew of the late Dr. W. L. Ellerbeck, well-remembered expert in lime and gypsum manufacture.

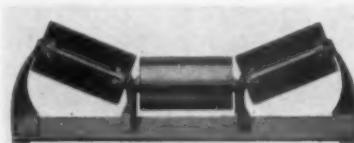
Mr. Ellerbeck advises ROCK PRODUCTS that some units have already been sold and are being manufactured locally. W. R. Cliffe, Hershey, Penn., has been appointed eastern sales representative. Mr. Ellerbeck says that he has received inquiries from all over the United States and South America. Advertising literature will soon be available.

Belt Conveyor Idler Removable In Service

CONTINENTAL GIN CO., Birmingham, Ala., has developed a type of belt

conveyor idler in which the rolls may be removed from supporting brackets by simply lifting them out even though the conveyor may be in operation. All rolls are made in 4-, 5-, and 6-in. diameters of either cast iron or steel, and they are equipped with anti-friction bearings.

Grease seals are all-metal labyrinth type, having five passes with the inner members protected from damage by a malleable iron nut. This nut has right and left-hand threads



Streamlined design conveyor belt idler

to permit fine adjustment of bearings, and the recessed groove fits down over sloping brackets, providing a support to the rolls as well as tying brackets together.

Ask Delay in Cement Rail Rate Increase

DIRECTOR JOSEPH B. EASTMAN announced that the Office of Defense Transportation has requested that increases authorized by the I.C.C. in the freight rates for cement, lumber, and sulphur be postponed pending a request for adjustment in these rates on certain routes. The O.D.T. also requested carriers to refrain from increasing the transcontinental west-bound rates on iron and steel articles and to waive increases recently authorized on iron and steel scrap. Abnormal movements by rail of commodities which heretofore have been shipped by water was one of the factors involved in this request.

Partnership

H. J. YOUNG of Lincoln, Nebr., has formed a partnership with George W. Olson in the Wahoo Concrete Products Co., Wahoo, Nebr. Mr. Young has been district engineer for the Portland Cement Association for over 15 years. This is a step in the expansion program started by Mr. Olson who has been making concrete block, concrete pipe, and furnishing ready mixed concrete and gravel for several years. Considerable new equipment was recently purchased.

Builds Garage

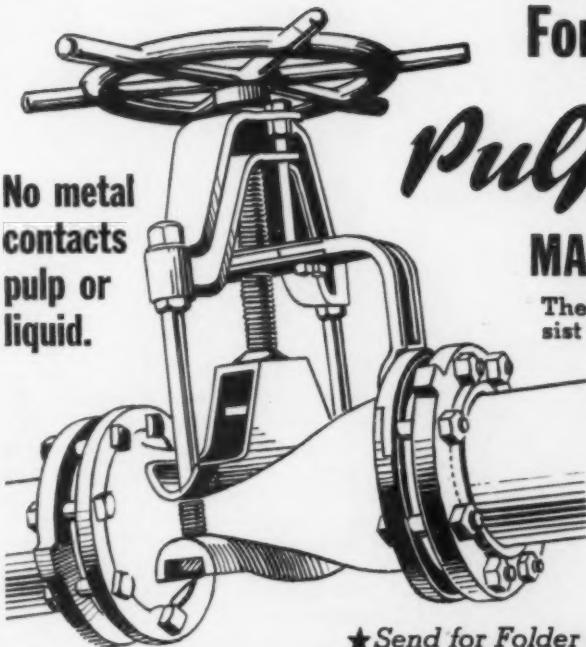
COLUMBIA CONCRETE PIPE CO., Okanogan, Wash., has built a new concrete block garage to provide service facilities for its trucks in meeting increasing business requirements.



Full drop-side, chutes the load far from the tracks . . . un-loads to either side.

THE largest capacity standard Automatic Air Dump Car you can use! Rated at 50 cu. yds. . . you can easily load 65 cu. yds. and the quick, clean dumping action puts the load far from the tracks. This is a rugged, heavy-duty car with proved economy and dependability and with the biggest pay load capacity you can get. Write for performance records.

PRESSED STEEL CAR COMPANY, INC.
(KOPPEL DIVISION)
PITTSBURGH, PA.



For ABRASIVE or CORROSIVE

Pulps and Liquids

MASSCO-GRIGSBY PINCH VALVES

These valves cut maintenance costs because they resist wear more than metallic interior parts of gate or plug valves.

There is no wear on the valve mechanism. They have no packing glands. Freezing temperatures will not destroy the sleeves. They are easy to operate.

Useful for solutions which are highly corrosive or for solutions which crystallize at normal temperatures and must be handled at temperatures up to 300°F, or for mixtures of solutions or solids which are both corrosive and abrasive. Recommended for transfer lines, for controlling flow in plant and in delivering product to storage or cars; also for handling fine dry materials. Valve shuts tight even on solid particles.

SIZES—1", 2" and 3" for continuous pressure up to 100 lbs.; 4", 6", 8", 10" and 12" up to 150 lbs. When writing, please state your problem.

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EDW. J. NELL CO.
Manila, P. I.
W. R. JUDSON
Santiago, Lima

Minerals Company Finds

GAYCO

AIR SEPARATOR ONLY ANSWER



Have you a separating problem in your effort to get maximum efficiency from your operation? A prominent minerals producing company troubled with removing fines (—200 mesh) from their silica-like product not only found that air separation, the GAYCO way, successively removed the fines, handling 170 tons for a 12 hour day, but also stepped up their grinding tonnage to maximum as well as keeping repairs and replacement costs practically nil.

This is a typical GAYCO performance story giving more uniformity, greater capacity, cleaner tailings, higher efficiency, covering a range from 60 to 400 mesh with the exclusive patented GAYCO Centrifugal Sizing Fan.

Get the facts told in the New GAYCO "Tell-All" catalog. Write today.



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SEPARATORS

Kindly send me a copy of the New Gayco Catalog featuring the advantages of Gayco Separators and data on materials that can be handled. We are interested in separating the following products:

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Title Address

Highway Construction in War Time Economy

By BROR NORDBERG

AMERICAN ROAD BUILDERS' ASSOCIATION, in its "Defense Highway Congress" held in Memphis, March 2-5, 1942, pledged full coöperation with the government war program in recognition that the first and only job to be done is winning the war. About 5000 prominent roadbuilders, repre-

senting all 48 states and 10 foreign countries, attended this, the 40th annual convention.

Wartime construction, defense construction progress, priorities and allocation, post-war public works, the future of federal aid, access roads, airports, wartime maintenance, de-

velopment of the strategic highway network and the Inter-American Highway were some of the important subjects taken under consideration. Prominent government officials, national authorities on specialized subjects and members of the War Production Board were on hand to lead the discussions and conduct clinics on priorities and other emergency procedure.

Restrict Road Building to Military Necessities

H. G. SOURS, 1941 president of the American Road Builders' Association, in his annual address opening the convention, said that the nation's roadbuilding program must be diverted solely into military channels "for the duration," and he discouraged the belief that now is the time for the construction of civilian highways which also might be used for military purposes. The road-building program must have two objectives, he said; the building of access roads to military establishments and to industrial sites engaged in war production and the maintenance and rebuilding of other roads on a strategic network of highways.

It is important to keep the motor transportation system in the best possible condition and, outside the war program, all that can be expected by the public is the maintenance of existing civilian highways and the re-building of wornout sections. We need roads now more than ever before, he said, but the need is for roads in different places.

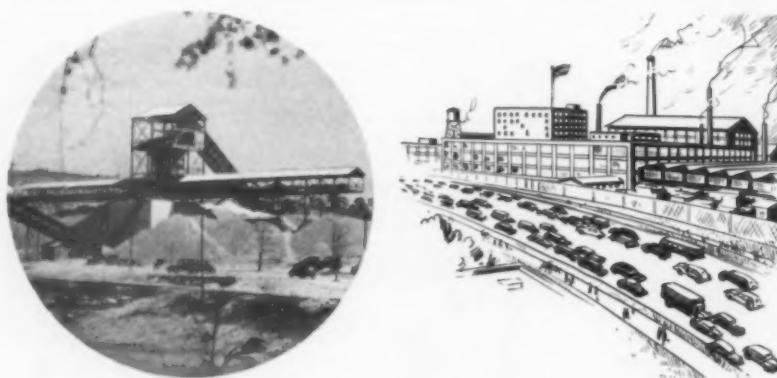
He urged expediency in any road building work undertaken due to the damage heavy war industry tonnage is already doing to roads and because new roads are needed immediately in certain essential places.

REPRESENTATIVE WILBURN CARTWRIGHT, (D., Okla.) chairman of the House Roads Committee, told the convention that federal funds will be restricted only to projects of definite war necessity and that the total of federal expenditures is likely to drop below the normal level of recent years. Only vital arteries for war commerce can be built and men who have been building highways must build bases, he said. Even the War and Navy Departments will not be able to get all the roads they want.

After-the-War Program

A program to follow during the war and post-war periods, adopted by the Association, embraces the following five points:

The continuation of federal support



AGGREGATE KEEPS "LIFE LINES" to DEFENSE PLANTS OPEN

Roads are the life lines over which thousands of workers' cars and great quantities of supplies move daily to defense plants supplying U. S. with war materials. Good roads are vital to America's war effort and are made possible by the great production of the aggregate industry.

In plants throughout the nation Cincinnati Conveyor Belts are helping on this big job . . . carrying great quantities of sand and gravel, crushed rock, and cement daily . . . giving steady, trouble free operation. Cincinnati Conveyor Belts serve well in war production because they have that inbuilt stamina to stand up under severe conditions.

THE CINCINNATI RUBBER MFG. CO.
CINCINNATI, OHIO

CINCINNATI CONVEYOR BELTS
ARE HELPING SUPPLY AGGREGATE FOR THE NATION

The Williams "SLUGGER" Crusher and Pulverizer Handles "ONE MAN" Stone • Saves Sledging
Also Makes 1 1/4", 3/4" or Agricultural Limestone in One Operation



CUTAWAY VIEW
of "Slammer" showing
heavy duty hammers,
liners and discs.

By reducing large rock to 1 1/4", 3/4" or agricultural limestone in one operation, the "Slammer" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Features include—Manganese steel hammers, heavy duty SKF bearings, adjustable breaker plate, hammer adjustments overcome wear, economical to operate.

The "Slammer" is built in Seven Sizes—from 30 to 150 horsepower—write for illustrated bulletins today.

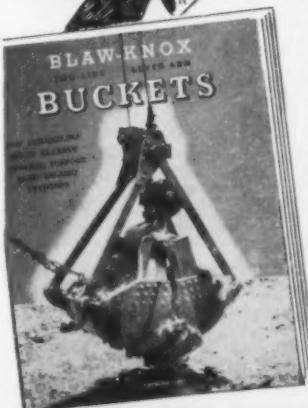
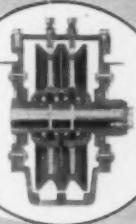
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OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
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PATENT CRUSHERS GRINDERS SHREDDERS

**BLAW-KNOX
BUCKETS have**

SEALED
BALL BEARING
SHEAVES



Sealed ball bearing sheaves in the lever arm reduce lost time and expense of bearing replacement, increase cable life and reduce friction, materially improving operating efficiency. This, and many other better features, that make BLAW-KNOX the "wise" buy in buckets are fully explained and illustrated in NEW CATALOG 1757. Send for your copy today.

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**BLAW-KNOX
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BLAW-KNOX FIRE AND RESCUE • ROAD FRAMES • STREET FORMS • CONCRETE SPREADERS • TAMPING ROLLES • VIBRATORS
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Here is an easy and economical way to check your plant operations and *know* that your products will meet the most exacting specifications. The GILSON Testing Screen accommodates up to 1 cu. ft. of sample, making from two to seven separations simultaneously, in about three minutes time.

WHY THE GILSON SCREEN

1. Makes tests quickly and accurately.
2. Two to seven separations simultaneously.
3. Screen trays independently removable.
4. Trays balanced to same weight.
5. Visible separation to refusal.
6. Few moving parts to wear out.
7. Engineered for long and practical service.

Send for illustrated literature today.

The GILSON SCREEN COMPANY
P. O. BOX 186 MERCER, PENNA.

Road Builders Meeting

(Continued from page 88)

for state road building on a matched basis; a post-war road building program as a vital way to buttress post-war depression and unemployment; an expanded highway program sufficient to serve the national economy, with stress on every type of road; the non-diversion of taxes collected by the federal government and the states for road-building purposes; and the prosecution of all road-building by the "time proved" contract system.

In a victory pledge made at the

close of the convention, the Association declared that an unselfish effort of all groups, including labor, industry, public officials and all citizens will be necessary to win the war. Another resolution was adopted to reaffirm that the contract system is the best method for road construction and to endorse the present system of breaking down large contracts into small contracts for expediency in defense projects.

COL. WILLARD T. CHEVALIER, publisher of *Business Week*, who presided at an "Information Please" session,

emphasized the opportunities in the war program for the small business man and said that business should be turned entirely over to war work except for essential civilian needs. He believes a post-war depression can be avoided, depending upon the psychological view taken. There will be a large accumulated demand for goods, he said, an increased supply of raw materials, increased skilled labor and the task of remaking industry into peace-time pursuits—all elements for a prosperous economy.

MASON MANGHUM, head of the Industry Contact Unit, WPB, in conducting a clinic on priorities, said that "business as usual" is out for the duration.

LION GARDINER, Jaeger Machine Co., Columbus, Ohio, and vice-president of ARBA, said that bad roads are saboteurs of our war efforts. He told of the appalling death rate from highway accidents in America, caused by steep hills, sharp curves, inadequate lighting, slippery pavements, narrow roadways and grade crossings. Other speakers emphasized that 1942 is the critical year. Contractors were urged to help build a vast network of airplane landing strips.

CARLOS BAZAN, director-general of highways in Mexico, said that Mexico is spending 170,000,000 pesos for this year's highway building program, three times greater than ever before. The Pan-American Highway would be three-fourths finished so far as Mexico is concerned after this money is spent, he said.

R. M. SMITH, deputy minister of highways, Ontario, Canada, said that in Canada roads to airports, industrial centers and military centers are all new and that roads to border points are now being built.

CHRIS J. SHERLOCK, Alabama Highway Director, was elected president of the American Road Builders' Association for 1942.

Ask Ban On Lake Dredging

A BILL has been introduced in the New York legislature which would ban dredging for sand and gravel along certain shore line areas off Buffalo, N. Y. Claims were made that swimming beaches were being destroyed and that fish spawning beds were ruined by the dredging operations. Local sand and gravel operators are fighting the legislation, stating that the allegations are not true and that the cost of sand and gravel would increase if dredging was stopped.

Proved Dependability

Constant repeat orders from satisfied customers is one of the surest indications that Deister Plat-O Vibrating Screens are demonstrating their ability on the job, to accurately grade more tons per hour at a lower cost per ton.

Elmer Hirschfield of the Quality Sand and Gravel Company, Wapakoneta, Ohio, says of his Deister Plat-O Screens, "Separation is very accurate. There is no transmitted vibration. Deister Screens are easier and quicker to change . . . their operation is dependable."

Simple design and rugged, all-welded construction . . . fully cushioned vibration . . . only two bearings . . . positive automatic screen cloth tension, are your assurance of dependable, day in and day out, 'round the clock operation to meet emergency schedules. Most sizes are still available from stock . . . better write or phone the Deister Machine Company today.

DEISTER MACHINE COMPANY
FORT WAYNE, INDIANA

Cement Plant for Hawaii

HAWAIIAN GAS PRODUCTS, LTD., Honolulu, T. H., is planning the construction of a cement plant on Oahu, according to Allan Renton, president and manager. Walter Ernst, a well-known cement technician, has been working on the plans. As a starter, it is proposed to convert the Waianae lime plant into a cement plant with an estimated 200 bbl. a day capacity. The new plant to be built would have a capacity of 2000 bbl. a day.

Build Crusher Unit

MCDONOUGH BROS., INC., San Antonio, Texas, is now building a new secondary crushing and rescreening unit, using an 18-ft. Pioneer screen and a 12-in. roll type crusher. This plant is one of the important factors in the crushed stone industry in this locality, and with the new equipment will be able to furnish any size toppling stone for highway construction which is now in demand for military roads.

Enter Fluxstone Field

TEXAS BUILDING MATERIALS CO., INC., Austin, Tex., has entered the fluxstone field, supplying material from a deposit said to be 96 percent pure CaCO_3 . This company has been a producer of crushed stone for other purposes for some time, and this is an entirely new venture, according to Mr. Rayburn Bell, manager.

Reopen Gravel Pit

A SAND AND GRAVEL PLANT at Afton, Wis., which had been closed for three years has been reopened to furnish aggregates for Great Lakes naval station construction. It is hoped to bring production up to 100 cars a day. The pit is operated by Central Lime and Cement Co.

Crushed Stone Plant Fire

CONSUMERS CRUSHED STONE CO., Racine, Wis., had a fire recently which destroyed the pump house and damaged the motors. About \$500 damage was done.

Concrete Pavement Yardage

AWARDS of concrete pavement for February, 1942, have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During February, 1942
Roads	1,109,620
Streets and Alleys	902,770
Airports	1,451,396
Total	3,463,786

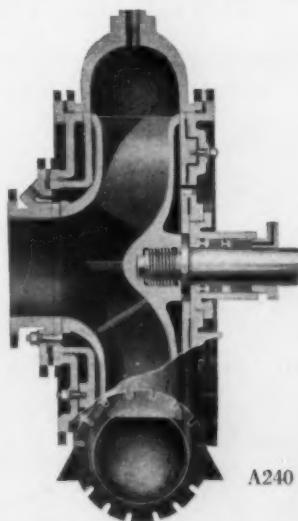
Amsco "COUNTERFLOW" Pump Produces Sand and Gravel for Arkabutla Dam

Arkabutla Dam, a government flood control project on the Coldwater River in Mississippi, will require approximately 4,158,000 cu. yds. of earthfill. The dam proper will be about 10,000 ft. long. A reservoir of 52 sq. miles will be provided.

Gravel and sand for the drainage mat at the base of the fill, and gravel for the spillway were supplied by Kochtitzky & Johnson, sand and gravel producers and dredging contractors of Avalon, Miss. Their dredge is equipped with a 16" Amsco "COUNTERFLOW" Pump, type "XH-CF", Form 44, right hand bottom discharge construction.

The "COUNTERFLOW" design effects the circulation of clear water under pressure, between the impeller shrouds and side plate liners, keeping out grit-laden water that would otherwise cause abrasive wear. This feature, together with free-flow impeller passages and the use of tough, impact and abrasion resistant 13% manganese steel for the impeller, shell, side plates and liners, assures a maximum service life with minimum maintenance.

Aggregates producers have long used Amsco Pumps successfully and today more than half of the dredge pumps in that work bear the Amsco trade-mark.

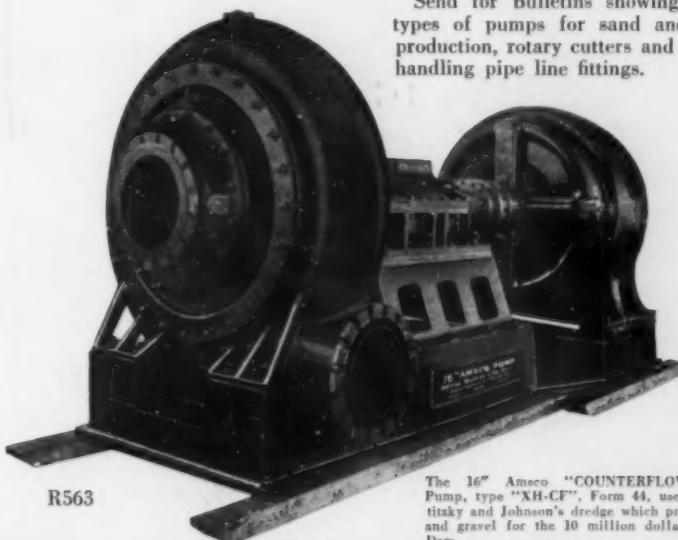


A240

"COUNTERFLOW" design details are shown on the section drawing above. Note clear water is forcibly circulated between the impeller shrouds and side plate liners. Wide passage, funnel-mouth impellers are used and are screwed onto the pump shafts for maximum security and ease of replacement.

The shock and abrasion resistant qualities of genuine manganese steel make it ideal for Rotary Cutters; and Dredge Pipe Line Fittings, such as elbows, pipe, nipples, reducers, expansion joints, hose nipples, and flap valves.

Send for Bulletins showing various types of pumps for sand and gravel production, rotary cutters and material handling pipe line fittings.



R563

The 16" Amsco "COUNTERFLOW" Dredge Pump, type "XH-CF", Form 44, used on Kochtitzky and Johnson's dredge which produced sand and gravel for the 10 million dollar Arkabutla Dam.



Amsco
AMERICAN MANGANESE STEEL DIVISION
OF THE ALUMINUM BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLOR.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO. OFFICES IN PRINCIPAL CITIES

Manganese Steel Castings for shocks and abrasion.
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Power Shovel Dippers. Dredge and Industrial Pumps.
Welding Materials for reclamation and hard-surfacing.

TRAFFIC NEWS

Recent Rate Changes

Following are the latest proposed changes in freight rates up to and including the week of March 14

Central

69050. Sand (other than industrial), in open top cars, without tarpaulin or other protective covering, C. L. Establish on, from West Elizabeth, Penn., to Vandergrift, Penn., 88c; Youngstown, O., 110c; from Courtney, Penn., to Vandergrift,

Penn., 88c, and Youngstown, O., 116c per net ton.

69556. Slag, crushed or crushed commercial (other than granulated), in open top cars, C. L., also ashes or cinders (coal), C. L. Establish on, from Portsmouth and New Boston, O., to destinations in Ohio, rates as shown below.

EXHIBIT A
From Portsmouth, O., and
New Boston, O.
(Rates in cents per net ton)

To Representative	B&O RR Stas Prop. (Ohio)	To Representative	NYC RR (W) Stas (Ohio)
			Prop. Rate
Hamden	94	Flagdale Siding	116
Lesmil	99	Moxahala	127
Chillicothe	88	Burr Oak	116
Anderson	90	Trimble	116
Harpers (Ross Co.)	105	Gallipolis	116
Greenfield	99	C&O Ry Stas	
New Vienna	110	McArthur	99
Midland City	116	Orland	105
Pleasant Plain	116	Logan	110
Loveland	127	Enterprise	116
Madeira	127	Lancaster	116
Cincinnati	127	Claron	105
Duncans Smitch	99	Alice	110
Zaleski	105	Gallipolis	116
Mineral	110	Pomeroy	116
Canaanville	116	RR Stas	
Coolville	127	Johnsons	110
Belpre	127	Kinderhook	110
Constitution	138	Stoutsburg	110
Marietta	138	Del Mount	110
Lynchburg	110	Lancaster	116
Washington		Bremen	116
C. H.	110	Flagdale	116
NYC RR (W) Stas		New Lexington	127
Bremen	116		

69557. Limestone, agricultural, unburnt, in bulk, in open top cars, C. L. Establish on, from Genoa and Martin, O., to Creston, O., 116c; Mansfield, O., 110c; Polk and West Salem, O., 116c per net ton, via N. Y. C. (W), Cleveland, O., Erie R. R. and via N. Y. C. (W), Martel, O., Erie R. R.

69574. Gravel, in open top cars, C. L. Establish on, from Elkhart, Ind., to Kingsbury, Ind., 94c per net ton, via N. Y. C. (W), South Bend, Ind., and G. T. (W).

69575. Sand, all kinds, and gravel, C. L. Establish on, from Beaver, O., to Black Lick, O., 116c per net ton (See Note 6).

69576. Slag, commercial, crushed (in bulk, in open top equipment); slag (other than commercial, crushed, in bulk, in open top equipment); ashes or cinders (except mill cinder and pyrites ore cinder); C. L. Establish on, from Youngstown, O., to Stony Point and Geneva, Pa., and from Hubbard, O., to Geneva, O., 88c per net ton.

69661. Lime, common, hydrated, quick or slaked, C. L., min wt. of 30,000 lb. and 50,000 lb. Cancel commodity rates on, from Petoskey, Mich., to destinations east of the Ohio-Pa. State Line, as published in Item 5500A to 5550A of C. F.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

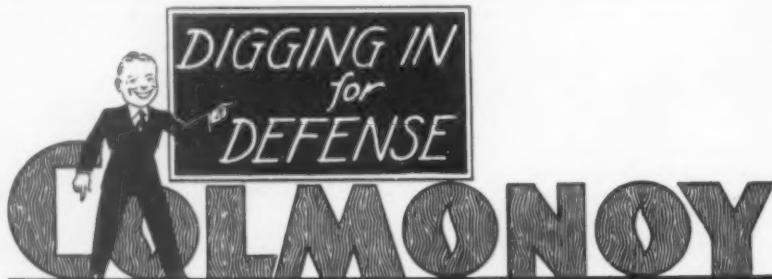
Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason. No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.



Don't Scrap Those Worn Parts! COLMONOY Will Put Them Back To Work!

Every new conveyor screw, gudgeon, pulverizing hammer or clinker plow you buy takes time and material that could be used in other ways.

Take a look at your worn parts. Many of them can be made serviceable by resurfacing the worn surfaces with COLMONOY. In most cases such reclaimed parts will actually outwear and out-perform new, unsurfaced parts many times over.

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Get latest catalog and full information regarding specific installations in your own industry.

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WHY you should specify SIMPLICITY SCREENS

Years of operating experience in many hundreds of plants and in many industries have been utilized to produce a screen which contains all these important features: Large Capacity, Positive Action, Durable Construction, Perfect Balance, Freedom from Blinding and Rubber Cushioned Power.

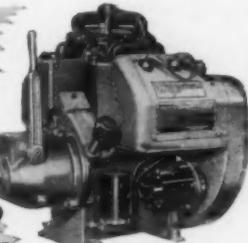
Users everywhere acclaim SIMPLICITY as the truly superior screen.

Our engineers will gladly study your particular screening problem and make a definite recommendation for its most practical solution.

Simplicity Engineering Co.
DURAND MICHIGAN

WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

Come of Age



Model VE-4, 22 hp.,
4 cyl., V-type Engine.
Other types and sizes:
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X "Old enough to vote", in terms of continuous production and development, Wisconsin heavy-duty air-cooled engines have also definitely come of age from the standpoints of industrial recognition and acceptance.

It has taken the hard proof of service, under the most trying operating conditions, in many lines of industry and power applications . . . to convince designing engineers, equipment manufacturers, and tough-skinned users that AIR-COOLED ENGINES, properly designed and built, cause less trouble and provide higher productive capacity than any other type of internal combustion unit within 35 hp. limits.

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MILWAUKEE, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines



DEPENDABILITY VITAL TO VICTORY



STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

Davenport Locomotives are assuming heavy responsibilities at many key centers of war activity. They will perform efficiently and dependably—moving VITAL WAR MATERIAL and conserving VITAL WAR TIME. The 30 ton Diesel-Mechanical power unit in service at Pearl Harbor typifies the many locomotives we are supplying to the Army, the Navy, our Allies, American war industries, and American war contractors. This keeps us busy but not too busy to meet the requirements of Davenport users who recognize their wartime responsibility for keeping their equipment in GOOD CONDITION.

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A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA



SAUERMAN LONG RANGE MACHINES

where there's work to be done

Economically . . .

SAUERMAN Machines are first choice because of their capacity, dependability, and low cost operation in digging, hauling, and placing sand, rock, and gravel at distances from 100 ft. up to 1500 ft.

Above is illustrated applied SAUERMAN economy—a small, inexpensive scraper installation that stockpiles crushed silica on the ground alongside washery and reclaims this stored material in required quantities to a drying plant.

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SAUERMAN BROS., Inc.

530 S. Clinton St.

Chicago, Illinois

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SPEED-UP YOUR
Clean Up and
EXCAVATING with a



Two Sizes for
Greatest Efficiency



1-Yard Excavator

KEYSTONE Offers

two sizes, sturdily built, to fit your needs. Model 19-A, 1½-yard shovel and crane for excavating and quarry clean-up. Model 18-A, 1-yard excavator, for special service—it is fitted with a 1-yard skimmer for sand-strata separation and recovery, trench-hoes for crevice cleaning upon serrated rock strata, etc. Our many years of experience in solving excavating problems assure you of getting a machine precisely adapted to your needs.

Rock Shovels — Dippers — Back Hoes — Skimmers — Drag Lines — Cranes.

Ask for Bulletins.

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Beaver Falls, Penn.

← 1½-Yard Shovel

For your speed-up schedule . . .
use the Brooks LOAD LUGGER

This is America's safest, simplest, speediest loading and dumping unit for moving materials. It increases the efficiency of hand loading and enables one truck with "a litter of bodies" to do the work of a whole fleet of ordinary trucks. A great time-saver in quarry operations, road work, feeding crushers, and many other industrial hauling jobs.



Low Headroom
No Counterweights
15 Seconds, Lift or Dump
Fits any Truck Chassis
One-piece Bucket

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Catalog 44

Knoxville, 804 Davenport Road, Tenn.
Distributors in all principal cities

Brooks EQUIPMENT AND MFG. CO.

A. L. Trf. 218M, and individual lines' tariffs of the P. R. R. and P. M. Ry., etc., classification basis to apply.

69662. (a) Lime, agricultural, common, hydrated, quick or slaked, C. L. min. wt. 30,000 lb.; (b) lime, agricultural, common, fluxing, hydrated, quick or slaked, C. L., min. wt. 50,000 lb. Establish on, from Lewisburg, O., to Logan, W. Va. (a) 18c and (b) 14c, viz., N. Y. C. (C). Cincinnati, O., thence C. & O. Ry.

69663. Sand, all kinds, and gravel, in open top cars, C. L. Establish on, from Rittenours, O., to South Point, O., 110c per net ton.

69665. Crushed stone and screenings, in straight or mixed carloads. Cancel rates on, published in B. & L. E. R. R. Trf. I. C. C. 1100, from Annandale, Branchton, Harrisville and Osborns, Pa., to Sheffield and Tionesta Ry. Stations, viz., Bear Creek Ford, Blue Jay, Kelleville, Mayburg and Nebraska, Pa., and similar rates in other individual lines' tariffs, classification basis to apply.

69668. Stone, crushed, in bulk in open top cars, C. L. Establish on, from Speeds, Ind., to Burns City, Ind., 85c per net ton.

69670. Lime, agricultural, common, hydrated, fluxing, quick, slaked or fibred, C. L. Establish on, between Alloy, W. Va., and Charleston, W. Va., 11c, min. wt. 30,000 lb. and 8½c, min. wt. 50,000 lb., via N. Y. C. (W) direct.

69671. Lime, viz., common, hydrated, quick or slaked, also agricultural or fluxing, C. L., min. wt. 30,000 lb. and 50,000 lb. Establish on, from Speeds, Ind., to stations in Ill., Ind., Ky., Mich., Ohio and W. Va., rates on the basis of the I. C. C. Dkt. 16170 Scale, as shown below: (Rates in cents per 100 lb.)

To	From Speeds, Ind.	
	—Proposed—	
	30,000 Pounds	50,000 Pounds
Chicago, Ill.	18	14
Greencastle, Ind.	14	11
Ashland, Ky.	18	14
Louisville, Ky.	10	8½
Owensboro, Ky.	14	11
Adrian, Mich.	18	14
Ann Arbor, Mich.	19	15
Detroit, Mich.	19	15
Grand Rapids, Mich.	19	15
Kalamazoo, Mich.	18	14
Lansing, Mich.	19	15
Midland, Mich.	21	17

69673. Limestone, agricultural, unburnt, and agricultural limestone screenings, in bulk, in open top cars, C. L. Establish on, to Frazeysburg, O., from Gibsonburg, O., 138c; Maple Grove, O., 127c; Sandusky and Woodville, O., 138c per net ton.

69690. Slag, commercial crushed and other than commercial crushed, in bulk, in open top cars, C. L. Establish on, to Villa Nova, W. Va., from Pittsburgh and Bessemer, Pa., 193c per net ton, via B. & O. R. R. direct.

69753. (a) Sand, naturally bonded molding, in all kinds of equipment, C. L.; sand (except naturally bonded molding; ground or pulverized sand) in closed equipment, C. L.

(c) Sand (except naturally bonded molding; ground or pulverized sand) in open top equipment, C. L. (see Note 1). Establish on, from Chicago, Ill., to Detroit, Mich. (a) 231 cents and (c) 220 cents per net ton.

Note 1—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars to be assessed.

69772. Sand (except industrial) and gravel, in open top cars only, C. L. will apply. Establish on, from Fairview, Pa., to Geneva and Stony Point, Pa., 121c per net ton.

69773. Industrial sand, C. L., per usual descriptions (a), (b) and (c). Establish on, from Grand Haven, Muskegon and Rosy Mound, Mich. Proposed rates (in

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MOVING MATERIALS THE EASY WAY**



**ELECTRO-MAGNET
VIBRATORS**

Open Up "Constipated" Bins and Chutes



**VIBRATORY
FEEDERS**

From lbs. to tons per hour by the twist of a Rheostat.



**GRAVIMETRIC
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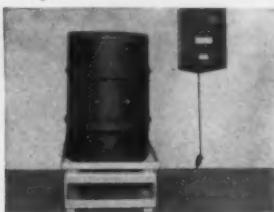
Weigh Feed Material to a 99% Accuracy.

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PACKERS**

Increase the Net Contents of barrels, drums, etc.

**LOW COST SCREENING
OF GYPSUM ROCK**



FIRST STEP IN

**Gold
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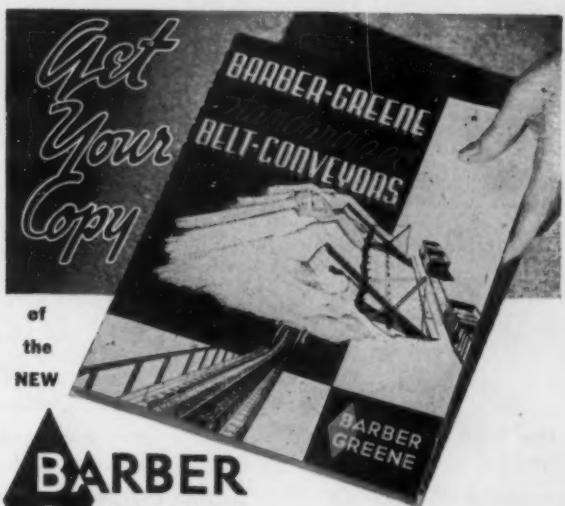
• The Savannah, Georgia, plant of the National Gypsum Co. converts 500 tons of gypsum rock into "GOLD BOND" Special plaster and plaster board every 24 hours. After the first crushing, most of this material is screened by a Link-Belt 2-deck vibrating screen. For 2½ years, a veritable torrent of crushed rock has poured through this screen, which has given continuous trouble-free operation at rock-bottom cost. As in numerous similar installations, the rugged, simple design of the Link-Belt vibrating screen has proved the answer to economical production.

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Vibrating Screens**



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Makers of Elevator Buckets of all types, Miteo Open Steel Floorings, Miteo Sheet Treads and Miteo Armorgrids. Light and Heavy Steel Plate Construction.

cents per net ton:

	(a)	(b)	(c)
Batavia, N. Y.	308	339	308
Bloomsburg, Pa.	363	399	363
Bradford, Pa.	330	363	330
Danville, N. Y.	330	363	330
Hasbrouck Heights, N. J.	429	472	429
Oswego, N. Y.	352	387	352
Seneca Falls, N. Y.	341	375	341

69785. Sand, naturally bonded moulding, in all kinds of equipment, C. L.; sand, (except naturally bonded moulding, ground or pulverized sand) in closed equipment, C. L.; sand (except naturally bonded moulding, ground or pulverized sand) in open equipment, C. L. Establish on, from the so-called Ludington Group, via: Ludington and Manistee, Mich., to Hasbrouck Heights, N. J., 440c per net ton, in open and closed cars. See Note 6.

69787. Slag, granulated, in open-top cars, C. L., see Note 3. Establish on, from Cleveland, O., to Rome, N. Y., 29c per net ton, via N. Y. C. (W.), Gardenville, N. Y., N. Y. C. (E.).

69788. (a). Limestone, unburnt, agricultural, in bulk or in bags, in box cars, C. L., min. wt. 60,000 lb.; (b) limestone, agricultural, in bulk, in open top cars, C. L., min. wt. 90 per cent of marked capacity of car except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, to Otisville, Mich., from Genoa and Martin, O., (a) 180c and (b) 143c; from Marblehead, O., 171c and (b) 153c per net ton. Route: From Genoa and Martin, O.—Via N. Y. C. (W.), Detroit, Mich., or Toledo, O., P. M. Ry. From Marblehead, O.—Via L. & M. Ry., Danbury, O., N. Y. C. (W.), Detroit, Mich., or Toledo, O., P. M. Ry.

69789. Stone, crushed, C. L., see Note 3. Establish on, from Wabash, Ind., to Aurora, Ill., 190c per net ton, via N. Y. C. (C.), Claypool, Ind., N. Y. C. & St. L., Hobart, Ind., E. J. & E.

69790. Lime, agricultural, common, fluxing, hydrated, quick or slaked, C. L. Cancel present rates on, from Cold Springs, O., to various pts. in T. L. A. S. F. A. and W. T. L. territories, published in C. F. A. L. Trif. 218, 563 and 573 series, incl.; also similar rates published in individual lines' tariffs, classification basis to apply in lieu thereof.

69807. Slag (a product of iron and steel blast or open hearth furnaces). C. L., min. wt. 80 per cent of marked capacity of car, except as noted, and crushed slag and crushed commercial slag, C. L. Cancel present rates on, from Wellston, O., to Cincinnati, O., published in B. & O. R. R. Tariff H-3279F.

69811. Sand, industrial and gravel, in open top cars, C. L. Establish on, from Robinson, Pa., to Geneva and Stony Point, Pa., 88c per net ton, via P. & L. E. R. R., Youngstown, O., Erie R. R.

69802. Feldspar, crude, ground or unground, C. L. Cancel present rate of 28c on, from E. Liverpool, O., to Erwin, Tenn., class or combination rates to apply in lieu thereof.

69838. Stone, crushed and screenings, in straight or mixed carloads, or visible capacity, actual weight will apply. Establish on, from Hillsville, Walford and Shaw Jct., Penn., to Conneautville, Penn., 85c per net ton, via P. R. R. direct, to expire June 20, 1942.

69840. Stone, crushed, C. L. Establish on, from Mier, Ind., to Milwaukee, Wis., 228c; South Milwaukee and Racine, Wis., 216c per net ton.

69850. Lime, agricultural, common, fluxing, hydrated, quick or slaked, straight or mixed, C. L., min. wt. 30,000 lb., lime, agricultural, common, fluxing, hydrated, quick or slaked, straight or mixed, C. L., min. wt. 50,000 lb. Cancel rates on, from Huntington, Ind., to points in C. F. A., T. L. A., N. E. F. A. and S. F. A. territories, published in C. F. A. L. Trif. 218M; 563C; Erie R. R. Trif. 156J and other individual lines' tariffs, account obsolete, classification basis to apply in lieu thereof.

Texas-Louisiana

6279-A. Limestone. Shipper's proposal to establish rate of 72c per ton of 2000 lb. on crushed limestone, carloads, min. wt. marked capacity of the car, except actual weight will govern on cars loaded to full visible capacity, from Dittlinger, New Braunfels and Ogden to Houston, Texas, restricted to apply only on crushed limestone to be used in blast furnace at Houston.

6393. Lime. Carrier's proposal to establish rates of 29c per 100 lb., min. wt. 30,000 lb., and 23c per 100 lb., min. wt. 50,000 lb., on common lime, including magnesium lime, hydrated, quick or slaked, carloads, from Dittlinger to Amarillo, Tex.

Southwestern

27364. Fluorspar, Alpine, Marfa, and Presidio, Tex., to Kansas City, Mo. To amend Item 1660, S. W. L. Tariff 20R, by increasing the rate to Kansas City, Mo., from 550c to 660c per ton of 2000 lb.

27368. Sand, gravel, crushed stone, etc., within and between points in Kansas and Missouri. To amend the description of Items 100-I, W. T. L. Tariff 210A, and Item 90H, W. T. L. Tariff 237C (sand-gravel-crushed stone, between points in Kansas and Missouri, respectively), to include: Clay, crushed tile and crushed sewer pipe, soil, cinders, crushed bricks or brickbats, slag, not pulverized, in bulk, oyster shell screenings (pulverized), common shells, whole or crushed.

DOLLAR FOR DOLLAR... WEIGHT FOR WEIGHT...



IT'S *Plymouth*
FOR HAULING PERFORMANCE

...That's why you'll find so many Plymouth Locomotives carrying the load from excavation to processing. Plymouth gives you SPEED to keep schedules—POWER to haul more tons per load—and RUGGED CONSTRUCTION that stands up under constant operation.

Let us show you how to reduce haul-time in your operations. Ask us for free analysis of your haulage problems. Write today!

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PLYMOUTH LOCOMOTIVE WORKS
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Type 20 the biggest value in the $\frac{1}{2}$ cu. yd. class. Available as shovel, crane, dragline, etc., on crawler, truck or pneumatic tired wheel mount.

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Classifiers

1. Start without unloading—an important factor if you run less than 24 hour shifts;
2. Give you close separation for any desired specifications;
3. Big tonnage—low power cost;
4. Mechanical simplicity.

Simplex or duplex—16" (spiral dia.) up. Write for Bulletin Bulletin 24HA and state your specific sand washing problem.

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1942

DEMANDS MORE AGRICULTURAL LIMESTONE

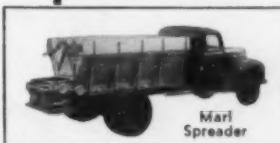
With Baughman Limestone Spreaders on the job you can easily fill the big orders to come for agricultural limestone—and be assured of properly applying the limestone on farmers' fields because the specially-designed revolving disc maintains an even distribution up to 40 ft. in width.

There is a Baughman Spreader to fit your plant and market—models range from 6 to 18 tons in size, including the three models shown here.

Get the facts today on the outstanding features of the 9 to 1 favorite spreader in 1941.



THE MAMMOTH



THE MASTER



THE NEW MARVEL

BAUGHMAN MFG. CO.

Specializing in Spreading Equipment
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**Boost Our American
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Be sure your war production effort in crushing is the most efficient. With AMERICAN you get Cast Steel Plates, Cast Steel Discs, Heavy Alloy Steel Shaft, SKF Spherical Roller Bearings and Manganese Lined Crushing Chamber.

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CRUSHERS AND PULVERIZERS



HIGH PRODUCTION

That Is What You Get When
Your Plant Is Equipped With

SECO

VIBRATING SCREENS

From the smallest to the largest sizes, SECO has a model for all jobs. A family of high producers.

Catalogue on request

SCREEN EQUIPMENT CO., Inc.
9 LAFAYETTE AVE. BUFFALO, N. Y.

5 REASONS WHY PRODUCTION-MINDED MANUFACTURERS DEMAND I. B. BUCKETS

1. Deep, clean bites practically eliminate hand shovelling.

2. Fast opening and closing action speeds up production.

3. Extra sturdy yet light in weight. Large sheaves reduce rope wear and lower maintenance.

4. 50 years experience behind every I. B. bucket.

5. Standard sizes ready for immediate delivery.

INDUSTRIAL BROWNHOIST
BAY CITY, MICHIGAN • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO

27410. Roasted dolomite, Dolly Siding, Mo., to Sterling, Ill. To reduce the present rate on roasted dolomite, carload (See Note 3), from Dolly Siding, Mo., to Sterling, Ill., from 275 to 258c per ton of 2000 lb.

Southern

26897-1 (carrier). Bauxite ore, C. L. Establish 447c gross ton, Abbeville, Ala., to Bastrop, La.

27576 (shipper; suggested by carrier). Fluorspar, C. L., min. 40,000 lb. Establish 578c net ton. Cerulean, Crayne, Crider, Fredonia, Marion, Mexico, and Princeton, Ky. to Haydenville, O.

27052 (shipper; suggested by carrier). Limestone, agricultural, ground or pulverized, C. L. Establish reduced rates from Gorman (Rock Hill) and Burns, Tenn., to N. C. & St. L. stations in Ky. Example:

	Gorman (Rock Hill)	Burns (Tenn.)
To		
Hickman, Ky.	86	99
State Line, Ky.	77	88
Benton, Ky.	77	88
Murray, Ky.	66	88

27644. Lime (calcium), acetate of C. L. Cancel, as obsolete, rates from Lyle, Tenn., to eastern and Va. cities, S. Atlantic ports and Chicago, Ill., published in SFTB Tariff 38-N and NC&StL Ry. I. C. C. 3429-A.

27653. Phosphatic sand or clay, C. L. Establish 620c net ton, Dunnellon, Fla., to Philadelphia, Pa.

27661 (by carrier). Slag, C. L. Establish 60c net ton, Nichols, Fla., to Frostproof, Fla.

27662. Feldspar, crude, C. L., min. 80,000 lb. Establish 100c net ton. Roxboro, N. C., to Bedford, Va. Truck competitive. Expires December 31, 1942.

27722. Lime, C. L. Establish rates from various origins shown in S. F. T. B. Tariff 382B to Cairo, Mizzelle and Putnam, N. C., Inlet, Pleasant Ridge and St. Brides, Va., and points taking same rates on usual basis.

27735. Reduce rates on limestone, ground or pulverized, C. L., from Austinville, Buchanan, Kerns, Miles, Rocky Point, Falling Spring, Eagle Mountain and Indian Rock, Va., to points in N. C. Statement of rates will be furnished upon request.

27755. Phosphate rock, C. L. Establish from Fla. mines to Hamilton, Ont., 825c; Beloeil, Que., 870c; and Buckingham, Que., 1175c gross ton.

27774. Feldspar, C. L., min. 50,000 lb. Establish to Eastland, Tex., from Erwin, Tenn., Minpro, and Sprucepine, N. C., 957c, and Bowditch, N. C., 983c net ton.

Trunk Line

40644. Dicalcium phosphate, C. L., min. wt. 60,000 lb., from Camden, N. J., to Mt. Holly, N. J., 11c, to Albany, N. Y., 24c, and to Buffalo, N. Y., 31c per 100 lb. in lieu of current 5th class rates of 14c, 30c and 39c respectively. Reason: See Note 5.

40646. Ganister rock, not ground, carloads (See Note 3), from Mt. Union, Harrison Walker No. 16, Moores Mills, Barre, Sproul, Claysburg, Wolfsburg, Madley and Port Matilda, Penn., to Jersey City, N. J., \$2.75 per net ton in lieu of current 6th class rate of 25c per 100 lb. Reason: See Note 5.

40647. Stone, natural (other than bituminous asphalt rock), crushed, C. L., and slag, crude or crushed, in bulk, C. L. (See Note 3), from Buffalo, N. Y., to Model City, N. Y., 77c per net ton in lieu of current 6th class rate of 91c per net ton. Reason: See Note 5.

40649. Dolomite, crude, C. L. (See Note 3), from Devault and Cedar Hollow, Penn., to Cape May, N. J., \$1.32 per gross ton in lieu of current 6th class rate of 18c per 100 lb. Reason: See Note 5.

Cement for Panama

CEMENT PRODUCERS in various localities are pressing for adjustment of their rates on export shipments by way of the Gulf ports so as to enable their participation in the tremendous purchases of this commodity being arranged for various developments at the Panama Canal, including construction of a third set of locks and a trans-isthmus highway. The Panama Canal requirements are said to total 6,000,000 bbl. From Buffington, Ind., Dixon, La Salle and Oglesby, Ill., on common cement, minimum 50,000 lb. when shipped to the southern ports there is a proposal to make the now applicable rates apply to shipside deliveries. From various Kansas origins, including Chanute, Fort Scott, Independence, Kansas City and from Hannibal, Mo., to New Orleans and sub-ports there is a proposal before the Southern Ports Foreign Freight Committee for reduced rates on cement for export when shipped in minimum carloads of 70,000 lb.

To Make Agstone

H. C. ADAMSON, Everton, Mo., and James Cawfield, Ash Grove, Mo., have started an agricultural limestone crushing plant in an old lime quarry one-half mile southwest of Ash Grove. The capacity of the plant is 150 tons an hour.

Seek Gravel Permit

SHEPARD BROTHERS, Lomita, Calif., builders of a 2600-unit defense housing project northeast of Long Beach, Calif., has applied for a permit to open a sand and gravel pit on South Western avenue, south of Palo Verdes Drive.

Calaveras Improvements

CALAVERAS CEMENT CO., San Francisco, Calif., reports to stockholders that demands for cement are high due to defense construction. Presi-

dent William Wallace Mein pointed out that the company had made many improvements during the year, and expected to spend \$150,000 for others during 1942.

No Machinery Exhibit At Mining Congress

IT HAS BEEN ANNOUNCED that at the request of the WPB the American Mining Congress and Exposition has cancelled its machinery exhibit which had been scheduled for the Music Hall, Cincinnati, Ohio, April 27 and 28. In place of the exhibit, there will be a two-day session at the Netherland-Plaza Hotel.

Change Name

CENTRAL ROCK CO., Mabel, Fla., is the new name for the company formerly known as Sumter Flint Rock Co. Mr. Newell, formerly with Sumter Flint Rock Co., is the new owner.

New Cement Quarry

SPOKANE PORTLAND CEMENT CO., Spokane, Wash., has been busy constructing a new crusher and grinding mill and opening up a new quarry at Marble near Colville, Wash. A new primary crusher is to be installed in the quarry.

New Glass Insulation

OWENS-CORNING FIBERGLAS CORP. has developed a new low-temperature insulation known as AE (asphalt-enclosed) board which is said to have all the insulating properties of cork and to be superior in several qualifications. While developed primarily for refrigeration, it also may be used as roof insulation.

Purchase Grinding Mill

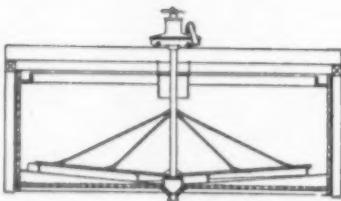
FOOTE MINERAL CO., Philadelphia, Penn., has purchased a grinding and milling plant at Exton, Penn. John Worcester will direct remodeling operations.



The Service Record of this wire rope continues to make and hold friends.

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A. LESCHEN & SONS ROPE CO.
Established 1857
5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle

USE HARDINGE THICKENERS



Extent Of Use

Several hundred Hardinge Thickeners are operating in metallurgical and chemical plants in sizes from laboratory units to large projects.

Mechanical Features

"Auto-raise" protects scraping and driving mechanism from overload. Spiral scraper insures rapid and positive removal of solids.

Designs Available

Standard steel, also stainless steel, wood and rubber covered mechanisms for use in corrosive liquids.

The Tray Thickener

with take-off of solids from each compartment results in maximum settling capacity per square foot of floor space.

Bulletin 31-C

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TORONTO, 200 Bay Street

OBITUARIES

FRANK C. BROWNSTEAD, superintendent of the Ironton plant of the Alpha Portland Cement Co., Easton, Penn., passed away recently.

WALTER L. HAEHNLEN, vice-president and director of the Giant Portland Cement Co., Philadelphia, Penn., died recently at the age of 66. Mr. Haehnlen also was president and director of the Tonopah & Goldfield Railroad, president of the Tonopah Mining Co., and a director of the Iowa Public Service Co.

LEVI C. PEACOCK, owner and operator of the Richmond Gravel Co., Richmond, Ind., with which he had been associated for the past 25 years, passed away recently at the age of 63. Mr. Peacock was born on a farm near Webster and educated in the Richmond schools, at Earlham College, and Chicago University.

A. B. MILLER, chemist, Hercules Powder Co., Wilmington, Del., died recently. Mr. Miller was one of the outstanding research men in the United States.

EDWARD CROSLAND STUART, Bartow, Fla., one of the developers of Polk county phosphate industry, passed away recently at the age of 89, following a four-day illness. Mr. Stuart came to Bartow in 1887 from Bennettsville, S. C., where he was born Dec. 8, 1852. He farmed there, and when he established himself in Bartow, he became manager of what later became the Polk County Abstract Co. Two years later he entered the real estate field, concentrating during the early years on phosphate properties. The Coronet Phosphate Co. was organized by him and C. C. Memminger at Coronet, and is still in operation.

WILLIAM A. WITHERINGTON, former superintendent of the Standard Portland Cement Co., Leeds, Ala., and more recently with the Universal Atlas Cement Co., Chicago, Ill., passed away at Natchez, Miss. Mr. Withington was born in Charleston, S. C., in 1869. In 1904 he was sent to Leeds, Ala., to erect a plant for the Standard Portland Cement Co., of which plant he eventually became general superintendent. When, several years later, the plant was acquired by the Universal Atlas Cement Co., he was retained as local purchasing agent, a position from which he retired six years ago. Mr. Withington was a pio-

neer in the cement industry in the South and was responsible for many improvements in quarrying.

HARRY M. ABBEY, owner and operator of the Diplomat Gravel Co., Galena, Kansas, died recently at the age of 66. Mr. Abbey was born in Potosi, Mo., and came to Galena 45 years ago. He was interested in mining many years and was associated with the late Colonel W. F. Sapp. In 1916, he organized the Diplomat Gravel Co., in partnership with the late C. W. Squires and the late R. A. Coles. Later he purchased the holdings of his two associates.

FREDERICK WOLFF, president of the Irvington Sand and Gravel Co., Irvington, Calif., died recently at the age of 61.

ROBERT A. HALL, retired slate and paint manufacturer, died recently at the age of 84. For thirty years Mr. Hall operated the red slate quarries at Hatch Hill, N. Y., and the slate and paint mills at Truthville, N. Y.

JAMES W. STEVENS, proprietor of the Stevens Sand & Gravel Co., Chelmsford, Mass., passed away recently at the age of 75.

JOHN ARTHUR SULLIVAN, river superintendent of the Pittsburgh Sand and Gravel Co., Pittsburgh, Penn., died recently while at work.

PRICES BID Contracts Let

WASHINGTON, D. C.: Government contracts were awarded to Consolidated Rock Products Co., Los Angeles, Calif., for 11,450 tons of coarse aggregate, and 7200 tons of sand, at \$17,370, and to Powhatan Lime Co., Strasburg Junction, Va., for 90 tons of hydrated lime, at \$9.95 per ton.

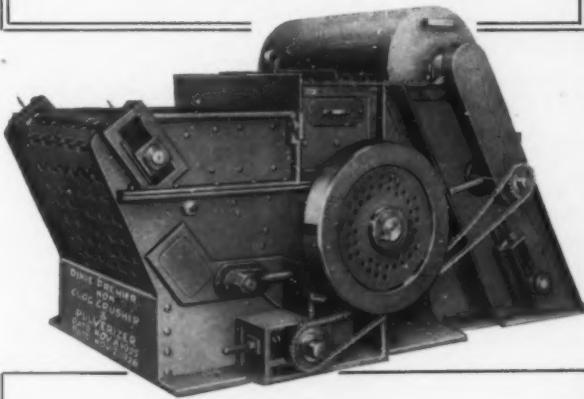
MALVERN, OHIO: The county commissioners awarded contract to Tri-County Gravel Co., Mineral City, for 700 cu. yd. of gravel at \$1.50 per cu. yd. for use on the Leavittsville-Glen-dale road; also for 200 cu. yd. of gravel at \$1.40 per cu. yd. delivered, for the German road; and 300 cu. yd. of gravel at \$1.40 per cu. yd.

KANSAS CITY, Mo.: Stewart Sand & Material Co. was awarded contract for 2396 cu. yd. of ready-mixed concrete at \$7.20 cu. yd.

(Continued on page 103)

WHEN PRODUCTION CANNOT LAG

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DIXIE Non-Clog HAMMERMILLS

NOTE THESE TYPICAL TOUGH JOBS LICKED BY DIXIES

1. Replaced four crushers for high moisture content bauxite . . . cut power in half . . . reduced drying costs . . . increased production.
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And with the patented Dixie adjustable back end the entire back of the mill can be moved towards the hammer points to prevent clogging, control quality and size of production.

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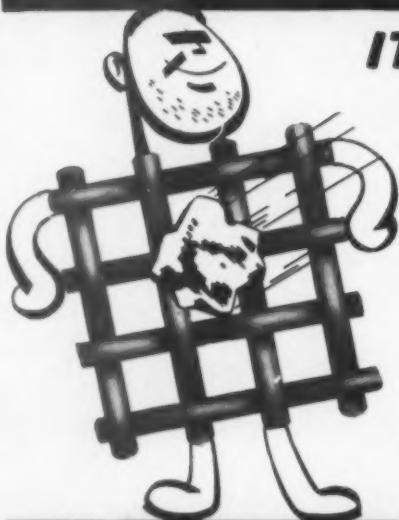
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★ Address this Coupon to: Dept. D-5, Page Engineering Company,
c/o Clearing Post Office, Chicago, Ill.
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bulletin titled "Your Dragline CAN Move Dirt Faster."

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Ordinary steel won't do—for screens that must give extra service in grading stone and gravel. That's why Roebling makes every pound of steel that goes into Roebling Screening—makes it in small, closely-controlled furnaces—to the exact analyses that mean utmost resistance against wear and vibration.

Then, the wire is drawn and tempered to Roebling standards, established by years of wire-making experience. And finally, fabricated into an accurate-mesh screen that assures proper grading—maximum production.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON
NEW JERSEY

Six Magnesium Plants To Be Built

WAR PRODUCTION BOARD has authorized the construction of six magnesium production plants. The following companies will design and erect the plants: Union Carbide & Carbon Corp.; American Metals Co.; National Lead Co.; Ford Motor Co.; Permanente Metals Corp.; and New England Lime Co.

New Dynamite Cartridge Has Been Developed

HERCULES POWDER CO., Wilmington, Dela., has brought out a new dynamite cartridge which will expand under tamping to fill the bore hole and concentrate the charge. The new cartridge, called "Tamtite" is said to eliminate the necessity of slitting cartridges, and permits concentration of a charge within the hole with little or no spillage of powder from the cartridge.

Ballast Contract

HERB TURNER AND SON, local contractors of Boscobel, Wis., have a contract to furnish 30,000 tons of crushed gravel to be used in building six miles of railroad tracks within an ordnance plant.

Get ALL-OUT Action in SCREENING

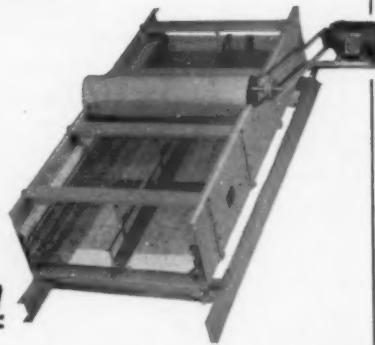


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UNIVERSAL'S large capacity makes record production figures possible. Their simplicity of construction means *low first cost* and *economical operation*.

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ROCK PRODUCTS

TACOMA, WASH.: Bureau of Reclamation has awarded a contract to the Superior Portland Cement, Inc., Seattle, for 7500 bbl. of portland cement at \$1.99 per bbl. The cement will be for the Roza project.

PROVO, UTAH.: U. S. Bureau of Reclamation has announced the following low bids for furnishing sand and gravel for four divisions of the Provo river project: The Salt Lake Valley Sand & Gravel Co., 1000 tons of sand, 750 tons of fine gravel and 1150 tons of coarse gravel at \$1,545 f.o.b. shipping point at Nash, Utah, and \$2,633 f.o.b. Deer creek siding; also for supplying 3000 tons of sand, 2100 tons of fine gravel and 2000 tons of coarse gravel for the enlargement of the Weber-Provo canal, at \$4,095 f.o.b. shipping point at Nash and \$9,629 at Heber; Owen Dean of American Fork, for furnishing 4400 tons of sand, 3100 tons of fine gravel and 3800 tons of coarse gravel for the enlargement of the Provo reservoir canal at the mouth of Provo canyon, at \$9,605 delivered at job, also for furnishing 1900 tons of sand, 1400 tons of fine gravel and 1600 tons of coarse gravel for enlargement of the Provo reservoir canal near American Fork, at \$4,165 delivered on the job.

NEW LONDON, CONN.: J. J. Doyle Sand & Gravel Co. submitted a price of \$1 per cu. yd. for delivering 1500 cu. yd. of sand and 60c per cu. yd. for having the sand loaded onto city trucks at the sand bank. Turello Brothers submitted a price of 85c per cu. yd. for delivering the sand and 70c per cu. yd. for loading it at the sand bank on city trucks. If the sand is to be delivered, Turello Bros. will get the award and if it is to be loaded on city trucks at the sand bank J. J. Doyle Sand & Gravel Co. will get the contract.

PERRY, Mo.: Ralls County has the following limestone contracts approved by the State ACP Committee: Concrete Materials and Construction Co., \$1.95 per ton, delivered and spread on any farm in Ralls County; Concrete Materials and Construction Co., \$1.65 per ton, delivered to any farm in Ralls County; L. J. L. Lime Co., \$1.15 per ton, f.o.b. quarry; Independent Gravel Co., \$1.15 per ton, f.o.b. quarry; Marblehead Lime Co., \$1.15 per ton, f.o.b. plant.

QUINCY, ILL.: Missouri Gravel Co. was awarded contract for 263 tons of sand for the federal section of the Gilmer-Ellington road at a price of \$1.25 a ton; and was low bidder for

PULVERIZERS for the reduction of Cement Materials, Limestone, Agricultural Limestone, Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour

Finesses: 20 to 350 mesh

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To Increase Capacities or Fineness of Present Grinding Plant—
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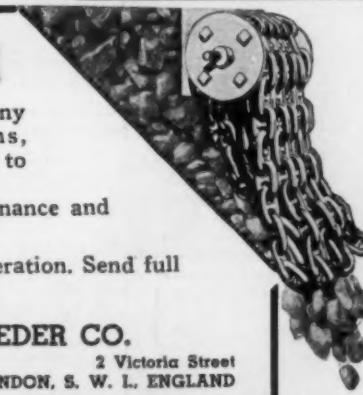
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TONNAGES
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Ideal for
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Stationary
or Portable

Crushes
Large Stone
to 2" minus
Down to
Agricultural
Dust

Adjustable
(8 Sizes)

Cross Section View of Pulverizer

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GRUENDLER CRUSHER & PULVERIZER CO.
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WEIGH WHILE
YOU CONVEY
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MERRICK SCALE MFG. CO.
188 AUTUMN ST. PASSAIC, N. J.

10,000 cu. yd. of gravel for state aid roads at a price of \$1.85 per cu. yd.; 10,000 cu. yd. of gravel for motor fuel tax roads at a price of \$1.95 a cu. yd.; and 3023 cu. yd. of gravel for the Beverly-Baylis road at a price of \$1.75 per cu. yd.

Manufacturers' News

Worthington Pump & Machinery Corp., Harrison, N. J., has announced the appointment of Joseph T. Wright as manager of the compressor and tool division at its Holyoke, Mass., works.

Bailey Meter Co., Cleveland, Ohio, has assigned the following engineers to field duty: J. T. Elder and J. E. Wood to Atlanta; J. E. Luppold to Seattle; E. P. Nye to Buffalo; R. B. Pogue to Milwaukee; W. D. Hibborn to Houston; J. J. Haslam to Kansas City; J. J. Wilber to Cleveland; C. E. Hicks to New York; J. R. Powell to Pittsburgh; S. G. Dukelow to Denver; R. V. Johnson to Chicago; W. D. Robinson to Boston; and C. C. Holtzman to Philadelphia.

Wickwire Spencer Steel Co., New York, N. Y., has appointed Gordon L. Crawford, previously sales manager of the Buffalo district, as assistant general sales manager with headquarters in New York. Mr. Crawford will continue as sales manager of the company's structural products division.

The United States Graphite Co., Saginaw, Mich., has advised that the present officers of the company are: H. Randall Wickes, president; Lawrence Field, vice-president and general manager; O. R. Miller, vice-president and secretary; Harold E. Ward, treasurer; and Violet W. Fox, assistant treasurer.

Sauerman Bros., Inc., Chicago, Ill., recently elected John Meyer as secretary of the company to succeed Gilbert H. Tompkins, who died in December, 1941. Mr. Meyer came to Sauerman Bros., Inc., in 1929 as purchasing agent and in 1936 was made assistant to the president. He also is a member of the board of directors. Prior to joining the Sauerman organization Mr. Meyer's activities had been in the field of railroad construction and engineering.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J., which this year is celebrating its 200th anniversary, has notified the company's 1800 employees that a \$25 Defense Bond will be presented to each baby born to an employee during 1942.

Ransome Concrete Machinery Co., Dunellen, N. J., has appointed the American Steel Supply Corp., Fort Wayne, Ind., to handle their complete line of construction equipment in certain sections of Indiana.

The Timken Roller Bearing Co., Canton, Ohio, announces the transfer of F. H. Lindus to sales promotion work located at Canton, Ohio. He will contact users of bearings regarding mutual sales and merchandising problems.

Morris Machine Works, Baldwinsville, N. Y., has elected Stuart J. Saks as president of the company. Mr. Saks is a graduate of Syracuse University, and for the last two and one-half years has been associated with the company as assistant to the president.

Pomona Pump Co., Pomona, Calif., has purchased the pump division of the Micro-Westco, Inc., of Bettendorf, Iowa.

R. J. Potts & Co., Kansas City, and Calkins & Holden, New York and Chicago, have announced their affiliation and change in name to R. J. Potts-Calkins & Holden, with headquarters in Kansas City, Mo.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., announces the election of Harry E. Smith as a member of the board of directors, replacing F. L. Curtis, former general manager of the Manhattan Division, who resigned from the Board.

ROCK PRODUCTS

for Smoother Vibrating Action
NEW HOLLAND Circle Throw **SCREENS**

- Five Different Grades of Stone without Changing Cloth
- Regulates Percentage of Fines in Larger Aggregates
- Built to Fit into Your Present Plant Set-up

LET NEW HOLLAND ENGINEERS SOLVE YOUR SCREENING PROBLEMS

NEW HOLLAND  **MACHINE CO.**
NEW HOLLAND, PENNSYLVANIA

ANOTHER "PENNSYLVANIA" REVERSIBLE HAMMERMILL

ready to "go on the line" in a new Cement plant designed for top efficiency in every Department.



- Major crushing by smashing impact
- Automatic hammer turning
- Product sizing control, and wear compensation is secured by Duplex case adjustments
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are some of the outstanding advantages which this REVERSIBLE Hammermill will provide in the Standard Preparation for modern Raw Side Grinding Mills.

Send for Bulletin No. 1030, and
PUT YOUR REDUCTION PROBLEMS UP TO US.



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PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications
Any size or style screen, in thickness of steel
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We can promptly duplicate your present screens at lowest prices

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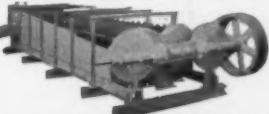


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ARMSTRONG-BRAY STEELGRIP FLEXIBLE BELT LACING

8 sizes boxed or in long lengths for wide conveyor belts. Best for rubber and fabric belts because it compresses belt ends and prevents fraying. Applied in a few minutes with a hammer. 2-piece hinged rocker pins.

Also, WIREGRIP Belt Hooks that fit any lacing machine. IMMEDIATE DELIVERY on both types.

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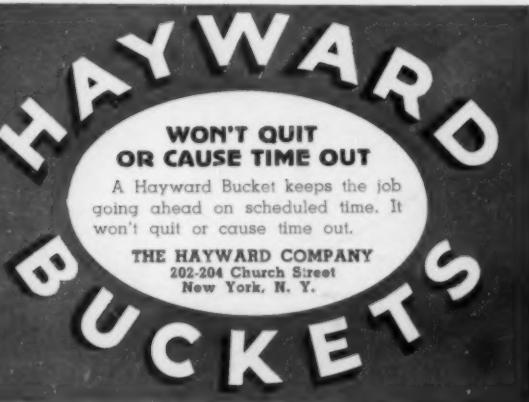
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Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structural, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc., Plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.



WILFLEY centrifugal SAND PUMPS

for slurries, sand tailings, slimes, acid sludges



Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. Write for Complete Catalog

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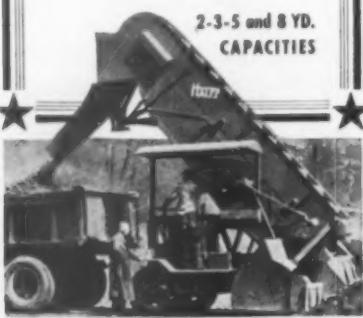
Denver Thickeners are built in the lowhead beam type (see diagram on the left) in sizes up to and including 75'. The beam design gives maximum headroom and flexibility, ideal for milling and industrial applications. An outstanding feature is the patented helical rake which immediately moves the material to the center cone in one revolution. Bulletin No. 3628.

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is in what it costs per yard per 100,000 yards. On that basis a HAISS will prove out to cost you less than anything else we know of... Write for catalog.

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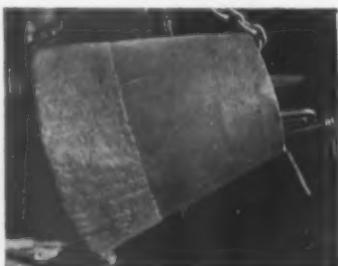
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APPLICATOR BARS
CAST WEDGE BARS



Gyratory Crusher Mantle Rebuilt
by Welding with Manganal.

SOLD ONLY THROUGH DISTRIBUTORS



The Marion Steam Shovel Co., Marion, Ohio, has reported the sudden death of Ray L. Williams, service manager for the past ten years. Mr. Williams joined the company 32 years ago as a clerk. For a short time he was in the engineering department and later became repair manager. The successful way in which this job was handled resulted in his various promotions.

Gar Wood Industries, Inc., Detroit, Mich., has appointed the H. H. Crow Equipment Co., Little Rock, Ark., as distributor for the hoist, body and tank divisions of the company.

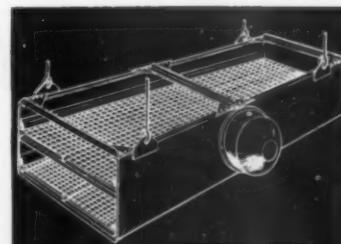
General Motors Truck and Coach, Pontiac, Mich., has announced a nationwide program of periodical truck inspection called the "Victory Maintenance" plan consisting of regular lubrication and adjustment, group overhaul operations, and complete engine or partial engine assemblies for replacement. This program will enable the truck operator to maintain his truck equipment at peak efficiency.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the election of Edwin H. Brown as vice-president in charge of engineering and development. Immediately after obtaining his engineering degree from the University of Nebraska in 1906, Mr. Brown entered the Allis-Chalmers training course for graduate engineers. Upon completion of the two year engineer apprentice course, he served in various capacities with the company, and then became assistant manager of the steam turbine department. Mr. Brown became manager and chief engineer of the engine and condenser department in 1935, in which capacity he served until his present appointment.

W. A. Jones Foundry and Machine Co., Chicago, Ill., held a two day conference of its national sales force and factory executives to discuss sales and production problems brought about by the tremendous war requirements for transmission products.

Edwards Company, Sanford, N. C., has announced the purchase of the Hill Diesel Engine Co., Lansing, Mich., one of the country's oldest and best known diesel engine manufacturing companies. Heading the new Hill management as president is Ralph B. Rogers, of New York City, who also is president of the Edwards Company. Mr. Rogers has been prominently identified with the diesel engine industry for many years as a distributor and producer of Diesel power units. For the present, at least, no changes in Hill manufacturing or merchandising policies are contemplated. R. E. Olds remains as chairman of the board of directors.

St. Paul Hydraulic Hoist Co., Minneapolis, Minn., has announced the election of W. S. Scruggs as vice-president of the company. Mr. Scruggs who has been connected with the motor truck and hoist industries for the past 25 years, will continue his duties as general manager.



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5 DISTINCTIVE FEATURES . . .

1. Full Floating Shaft.
2. Eight Positive Stroke Adjustments (quickly changed).
3. Oil Lubricated.
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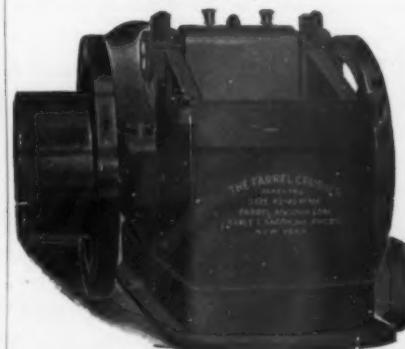
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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

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ROTARY KILN SPECIAL
10'x125' Power & Mining Mchry. Co., now Allis-Chalmers. 3/4" shell, 14" tires, 16" supporting rolls, 8" roll journals, girth gear, 12" face. Used six months.

ROTARY DRYERS
Indirect Heat, 2'-4'x20'. Ruggles-Coles Type B-2. Direct Heat, 5'x30', 6'x60', 6'x60', 7'x60', single shell. Steam Tube, 6'x35'. Louisville. Atmospheric Truck Dryer: 24 truck Proctor & Schwartz. Truck Dryer, 40 trays per truck, 4166 sq. ft. tray surface, 10,858 lineal feet 1 1/4" piping, 125 lb. steam pressure in coils.

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Tube Mills: 6'x22', Hardinge, straight side, iron lined. 6'x22', direct connected A.C. motor. 2'-5'x20' Bonnot, silox lined. Tube Mills with steel gears and steel heads. 2'-6'x20' Smith, silox lined. 5'x22' Allis-Chalmers, iron lined.

HARDINGE CONICAL MILLS
Silox lined: 4'x16", 5'x22", 6'x22", 6'x48", 8'x18", 8'x30".

Iron lined: 4'x16", 5'x22", 6'x22", 8'x18", 8'x30", 8'x36" with motor; 8'x48" with air classifier; 8'x48"; also 6'x16", with motor and balls.

CRUSHING ROLLS
Single Roll, 30"x30" Jeffrey, 21x40" and 21x50" Pennsylvania.

Double Roll: 42"x16" Allis-Chalmers Anaconda type, at Waukon, Iowa. 36x16" Traylor and Allis-Chalmers.

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2'-10' Sturtevant, 2'-14' Gaye, 3'-8" dia. Raymond double cone Separators, each with fan, cyclone, piping, etc. Can offer each of these Raymond Separators with 6' Hardinge ball mill.

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1-5 roll high side and 3-6 roll low side; also beater type pulverizers in No's. 0000, 00, 0, 1 and 3. Also No's. 6, 8 and 94 Imp type.

STEEL STORAGE TANKS
Horizontal: 28'-10x26', 10x36', 8x24'.

Vertical: 10x30', 10x25', 2-8x30', 5/8" plate.

VIBRATING SCREENS

2-Sets of Type 39 double deck, 4x5' Tyler Hummers; 4x3', 2-deck; 4x7' Leahy 2-deck, motor driven; 3x10' Kennedy, 3-deck; 3x5' Kennedy, single deck.

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1-20" Superior McCully.

1-27" Gates, with 100 H.P. A.C. motor.

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1-Kennedy No. 19, No. 25' feed, 3-F.

1-No. 40 Telsmith, 5" feed, 3/4" discharge; also No. 40 with 40 H.P. A.C. motor.

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1-15" Austin.

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222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 12

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24"	3	1/8" — 1/32"
24"	3	1/8" — 1/32"
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18"	4	1/8" — 1/32"
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Index to Advertisers

American Cable Div.....	Inside Back Cover
American Chain & Cable Co., Inc.	Inside Back Cover
American Manganese Steel Div.	91
American Pulverizer Co.	97
Anchor Concrete Machy. Co.	72
Armstrong-Bray & Co.	105
Austin-Western Road Machy. Co.	26
Babcock & Wilcox Co.	Front Cover
Bacon, Earle C., Inc.	106
Baughman Mfg. Co.	97
Barber-Greene Co.	95
Besser Mfg. Co.	62
Bethlehem Steel Co.	23
Birmingham Rail & Locomotive Co.	108
Blaw-Knox Co.	89
Bradley Pulverizer Co.	103
Brill Equipment Corp.	110
Brooks Equipment & Mfg. Co.	94
Buckeye Traction Ditcher Co.	4
Bucyrus-Erie Co.	Outside Back Cover
Buell Engineering Co.	18
Carlyle Rubber Co., Inc.	108
Chain Belt Co.	21
Chicago Perforating Co.	105
Cincinnati Rubber Mfg. Co.	88
Classified Advertising.	107, 111
Cleveland Wire Cloth & Mfg. Co.	112
Colorado Iron Wks. Co.	97
Combustion Engineering Co., Inc.	22
Consolidated Products Co., Inc.	107
Davenport-Besler Corp.	93
Deister Concentrator Co.	99
Deister Machine Co.	90
Dempster Bros., Inc.	78
Denver Equipment Co.	105
Dewey & Almy Chemical Co.	77
Diamond Iron Works, Inc.	85
Dixie Machinery Mfg. Co.	101
Dorr Company, Inc.	10
Eagle Iron Works.	80
Easton Car & Construction Co.	1
Ensign-Bickford Co.	114
Equipment Corporation of America	107, 109
Fate-Root-Heath Co.	96
First Machinery Corp.	107
Frog, Switch & Mfg. Co.	103
Fuller Co.	24
Gardner-Denver Co.	83
Gates Rubber Co.	13
Gay, Rubert M., Div.	87
General Electric	9
Gilson Screen Co.	89
Gruendler Crusher & Pulv. Co.	104
Gulf Refining Co.	16
Haiss, Geo., Mfg. Co.	106
Harding Co., Inc.	100
Harrington & King Perf. Co.	99
Hayward Co.	105
Hendrick Mfg. Co.	95
Industrial Brownhoist Corp.	98
Jackson & Church Co.	73
Jaeger-Lembo Mach. Corp.	108
Jaeger Machine Co.	67
Jeffrey Mfg. Co.	102
Kent Machine Co.	72
Keystone Driller Co.	94
Leschen, A., & Sons Rope Co.	99
Lima Locomotive Works, Inc. (Shovel & Crane Div.)	80
Link-Belt Co.	95
Ludlow-Saylor Wire Co.	Inside Front Cover
McLanahan & Stone Corp.	105
McLeod, Alexander T.	107
Manhattan Rubber Mfg.	14
Master Builders Co.	71
Merrick Scale Mfg. Co.	104
Mid-Continent Equipment Co.	110
Mine & Smelter Supply Co.	87
Naylor Pipe Co.	83
New Holland Machine Co.	104
New York Trap Rock Corp.	107
Nordberg Mfg. Co.	113
Ohio Screen & Engineering Co.	108
O'Neill, A. J.	110
Osgood Co.	97
Owen Bucket Co.	112
Page Engineering Co.	101
Pennsylvania Crusher Co.	105
Pioneer Engineering Wks.	12
Plymouth Loco. Wks.	96
Portland Cement Assoc.	73
Pressed Steel Car Co. (Koppel Div.)	86
Productive Equipment Corp.	106
Quinn Wire & Iron Wks.	73
Raymond Pulverizer Div.	22
Roebling's, John A., Sons Co.	102
Rollway Bearing Co., Inc.	3
Ross Screen & Feeder Co.	103
Ryerson, Job. T., & Son, Inc.	105
Sauerman Brothers	93
Screen Equipment Co.	98
Simplicity Engineering Co.	93
Sly, W. W., Mfg. Co.	59
Smith, F. L., & Co.	5
Smith Engineering Works.	11
Stulz-Sickles Co.	106
Sturtevant Mill Co.	17
Sunnyside Granite Co., Inc.	108
Syntron Co.	95
Thew Shovel Co.	25
Tidewater Equipment & Machy. Corp.	109, 111
Timken Roller Bearing Co.	6
Traylor Engineering & Mfg. Co.	7
Tyler, W. S., Co.	103
U. S. Treasury Dept.	79
Universal Crusher Co.	15
Universal Road Machy. Co.	87
Universal Vibrating Screen Co.	102
Unverzagt, G. A.	116
Wall-Colmonoy Corp.	92
Walsh, Richard P.	110
Werner, S. E.	111
Wickwire-Spencer Steel Co.	8
Willfley, A. R., & Sons, Inc.	105
Williams Patent Crusher & Pulv. Co.	89
Wisconsin Motor Corp.	93



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PB-43

PRIMACORD-BICKFORD DETONATING FUSE

This is no time to have machine shutdowns. By lasting so much longer **TRU-LAY PREFORMED** reduces shutdown frequency and steadies production.

This is no time to have workmen laid up with blood-poisoned hands. Some operators have drastically reduced accidents by adopting American Cable **TRU-LAY PREFORMED**—the safer rope.

This is no time to waste steel through the use of short-lived equipment. By lasting longer and working better **TRU-LAY PREFORMED** conserves steel for other essential machines.

American Cable engineers will gladly give you the benefit of their experience in helping you make your wire ropes last longer. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

AMERICAN CABLE DIVISION • WILKES-BARRE • PENNSYLVANIA
 District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.
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ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

GET GOING IN TOUGH GOING

with a

120-B

Take really tough rock; add the peak loading requirements of wartime production, and you've got the kind of job for which the 5-yard Bucyrus-Erie 120-B was designed. It will give you maximum output because it has a high-speed cycle and the stuff to stand up to sustained fast performance. At the right are some of the reasons:

① Long effective upper boom section, big sheaves and single part of bail pull and line of backward thrust. This means maximum effective digging force at the dipper teeth, and means long rope life, too.

② Getting maximum strength from every pound of weight means weight. This means a fast swing with low power requirement.

③ All digging motions are governed by three small master switches. It's easy for an operator to maintain a fast pace throughout the shift.

④ Mounting, propelling and steering machinery have proved their efficiency over thousands of miles of travel, cut moving time to a minimum.

⑤ Simplicity and strength of design and materials, extensive use of anti-friction bearings and oil gear enclosures, these mean steady performance as well as a fast cycle.

When you need big output in tough digging, find out the full story on heavy-duty Bucyrus-Erie equipment.

BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN